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An evening of overdue celebration and awards

International trends in raising revenue to fund roads

From risk to reliability – mastering transport compliance with DGM



**The Chartered
Institute of Logistics
and Transport**

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THE CHARTERED INSTITUTE OF
LOGISTICS & TRANSPORT NZ

ON THE COVER

The new Ferry Holdings board is engaging with shipyards to build new ferries, assessing alternative proposals, and collaborating with KiwiRail, Port Marlborough and CentrePort on the landside infrastructure considerations.

Photo: KiwiRail brand toolkit

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In the next edition

The editorial team welcomes expressions of interest for submitting an article for the June 2025 edition of this journal, especially from young professionals (those under the age of 35). Contributors should in the first instance contact the editorial convenor, Murray King (email murray.king@xtra.co.nz) to discuss their article. **Deadline for the June 2025 edition: May 9 2025.**

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Dr Kim Hassall: Leading safety and professional development in transport and logistics

BY JAMES PAUL

THE CHARTERED INSTITUTE OF LOGISTICS AND TRANSPORT (CILT) plays a pivotal role in advancing professional standards across the global logistics and transport sectors. Recently, Dr Kim Hassall was appointed as the new CILT International Vice-President, succeeding Fiona Knight.

During his visit to Wellington recently, Dr Hassall shared insights on key safety initiatives undertaken by CILT Australia, with a particular focus on the Construction Logistics and Community Safety Standard (CLOCS-A), an initiative that could offer significant benefits to New Zealand's transport and logistics landscape.

Dr Hassall's extensive background in transport and logistics policy, professional development, and research positions him as a leading advocate for industry progress. With over a decade as Chair of Education and Professional Development at CILT Australia, and as its immediate past Chair, he has been instrumental in shaping policies and training programmes that enhance safety and efficiency within the sector.

Beyond CILT, Dr Hassall has worked closely with government bodies and academic institutions, helping develop frameworks such as Australia's National Heavy Vehicle Driver Competency Framework. His leadership in performance-based standards (PBS) for high-productivity vehicles has driven significant road safety improvements and cost efficiencies. With Australia projected to prevent 193 fatalities by 2033 due to PBS implementations, his efforts demonstrate the tangible impact of informed transport policy.

Bringing CLOCS-A to New Zealand

One of the key messages of Dr Hassall's presentation was the potential application of CLOCS-A in New Zealand. This initiative, which evolved from the UK's original CLOCS standard, was developed in response to high fatality rates among vulnerable road users, particularly during London's infrastructure boom leading up to the 2012 Olympics. The standard establishes rigorous safety requirements for any road-going vehicles operating in construction zones, ensuring safer interactions between trucks, cyclists, pedestrians, and other road users.

In Australia, CLOCS-A has been progressively adopted, with New South Wales making it



Fiona Knight (left), Dr Kim Hassall, and Karyn Welsh.

mandatory for large infrastructure projects and other states, including Victoria and Queensland, preparing to follow suit. The CLOCS-A team was led by CILT Australia's Chief Executive Karyn Welsh and former International Vice President Fiona Knight, both of whom have initiated the groundwork in bringing CLOCS-A exposure to New Zealand.

The success of the initiative lies in its enforceability – companies that fail to meet CLOCS-A accreditation simply cannot tender for major projects. The benefits have been measurable, with reported reductions in road fatalities and serious injuries.

For New Zealand, Dr Hassall believes that adapting CLOCS-A would be a straightforward but impactful step. He pointed out that while New Zealand has seen fewer construction transport-related fatalities, even a single preventable death is one too many. The adoption of CLOCS-A, with adjustments tailored to local conditions, could significantly enhance road safety for vulnerable users. Additionally, the initiative aligns well with existing New Zealand transport policies and safety frameworks, making integration relatively seamless.

The implementation of CLOCS-A in Australia required extensive collaboration across four key working groups: driver skills, vehicle technical standards, logistics coordination, and marketing/PR. Dr Hassall emphasised that a similar multi-disciplinary approach would be essential for New Zealand. While CLOCS-A

is a major focus, Dr Hassall also highlighted broader transport and logistics initiatives in which CILT Australia has been involved. One such initiative is the PBS scheme mentioned above.

Additionally, Dr Hassall touched on the restructuring of Australia's Heavy Vehicle Licensing system, a comprehensive reform designed to modernise training and certification processes. These efforts align with CILT's core mission: promoting continuous professional development and ensuring that transport professionals are equipped with the latest knowledge and skills to operate safely and efficiently.

Another key takeaway from Dr Hassall's visit was the potential introduction of professional certification programmes in New Zealand. Currently, only two CILT chapters – Australia and Singapore – offer specialised professional designations, including Certified Practising Logistician, Certified Transport Planner, and Certified Passenger Professional. These certifications provide industry recognition for professionals in freight, transport planning, and passenger services.

There is great potential for these certifications in New Zealand, particularly given strong industry interest at past conferences, Dr Hassall says. He emphasises that certification would remain open to all professionals, not just CILT members, making it an accessible and valuable credential for the wider transport community.



An evening of overdue celebration and awards

A perfect example of the transport and logistics sectors' expertise and dedication. *Photos supplied*

THE CILT SOUTHERN SECTION BROUGHT NEARLY 50 PEOPLE TOGETHER AT THE LOFT IN CHRISTCHURCH LATE LAST YEAR TO CELEBRATE THE BEST AND BRIGHTEST IN THE LOGISTICS AND TRANSPORT SECTORS.

Against the backdrop of a challenging yet dynamic year, the event served as a platform to recognise outstanding contributions, innovative thinking, and excellence across the sector, reinforcing the vital role transport and logistics play in keeping New Zealand moving.

Southern Section Chairperson Dan Patrick says the event was a perfect example of the expertise and dedication the sector has.

"All of the award recipients should be extremely proud of their achievements – it was a brilliant occasion to celebrate their successes. It was also a great opportunity to play host to the Past President Diane Edwards, and recognise her contribution to the Institute over all these years."



Young Achiever of the Year

The Young Achiever 2024 is Mitchell Simpson from Foodstuffs South Island. His role there is to ensure their internal food safety programmes are of the highest quality. This includes training and supporting warehouse leaders on food safety requirements, but also keeping senior management accountable for the impacts they have on Foodstuffs operations.

A key achievement was moving the process from being a "back of the mind" concept for staff to being a "front of mind" activity for the storepeople, transport, and management teams, including dealing with product recalls. Mitchell has introduced feedback processes, identification of potential improvements, and now proudly boasts the title of Product Recall Continuous Improvement Champion.

Rising Star Young Employee of the Year

Tayla Shaw, the Rising Star for 2024, is described as a standout professional by one of her clients. She consistently demonstrates talent, dedication, and an unwavering commitment to excellence in the sector, thus being an excellent ambassador for Sorted Logistics.

Her five-year career with Sorted encompasses customer service activities, spearheading a process to optimise the inbound stock build process for a major client, and developing and implementing measurable KPIs for all customers. She is regarded as a great mentor and role model for her staff and colleagues.



Best published article

Entitled *Modelling Consumers' Preferences for Time-Slot Based Home Delivery of Goods Bought Online: An Empirical Study in Christchurch*, the article published in the international journal *Logistics* by authors Ashu Kedia, Dana Abudayyeh, Diana Kusumastiuti and Emeritus Professor Alan Nicholson was the winner of this year's best published article.

The article investigates consumer preferences for receiving home deliveries during various times, such as early morning, morning, afternoon, late afternoon, and evening. The study was conducted in Christchurch using data collected through a survey of 355 residents.

The findings revealed that consumers preferred the late afternoon (3pm – 6pm) time slot for receiving home deliveries. The authors concluded that off-peak delivery options are less likely to be successful in reducing the number of unsuccessful home deliveries, transportation costs, traffic congestion, and pollution in urban areas.

The study also examined the factors influencing customer preferences for late afternoon deliveries, including age, educational qualifications, employment status, household composition, and online shopping experience. The authors suggest that further research should consider alternative delivery methods, such as delivery to local shops, locker points, car boots and unattended home delivery, as well as the impact of the COVID-19 pandemic on online customer behaviour.

The full article is available to read at www.mdpi.com/2305-6290/8/2/47.

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Sir Bob Owens Memorial award

Readers will recall the article about Chris Gunn's award in the December issue, and the presentation of the award during a site visit to KiwiRail's train control. It was good to be able to recognise Chris in Christchurch, his "home" Section. He was presented with the formal certificate and the miniature pin he will hold for life.



MITO / CILT Scholarship – Bay of Plenty

Krystal Braysshaw, a class V truck driver in the Bay of Plenty, is the winner of the MITO / CILT scholarship. Krystal, also a volunteer firefighter, is absolutely committed to training, not just for her work, but with Fire and Emergency NZ and the wider community. She already has an impressive CV of training and qualifications, is into power lifting, and her goals include training in dangerous goods classes in the future.



Diane Edwards hands Dan Patrick, Southern Section Chairperson, the trophy in recognition for the Section's success in introducing the largest membership increase in the last financial year. Southern Section has won it three years in a row, since its inception in 2022.



South Port's Half-Year Financial Year 2025 Results highlighted 131 calls by large vessels, an increase of 11 per cent on the first half of 2024, and is a direct reflection of the increased bulk cargo flows through the port. *Photos: South Port*

Expanding efficiencies leads to increased volume with fewer ships

BY JAMES PAUL

SOUTH PORT NEW ZEALAND (SOUTH PORT)

has marked a significant milestone with its recent half-year financial results, reflecting a period of operational improvements and enhanced efficiency.

The port, which serves as a crucial hub for southern New Zealand's logistics and transport network, has successfully increased the volume of cargo handled while operating with fewer container vessel calls.

South Port's Half-Year Financial Year 2025 Results highlighted 131 calls by large vessels, an increase of 11 per cent (first half of 2024: 118), a direct reflection of the increased bulk cargo flows through the port.

Total cargo activity was 1,691,000 tonnes compared with 1,488,000 tonnes in 1H24. This represents an increase in cargo flows of 203,000 tonnes or 13.6 per cent. Increased tonnages in comparison to the prior half year were logs (+31,000 tonnes), fertiliser (+41,000 tonnes), woodchips (+59,000 tonnes) and stock food (+143,000 tonnes).

Due to the temporary closure of a potline at Tiwai Point, raw material imports and aluminium exports decrease in 1H25. New Zealand Aluminium Smelter (NZAS) is expected to return to full production by April 2025.

But as smelter activity represents 30 per cent of South Port's cargo volumes, the closure played a large part in decreases in alumina imports (-53,000 tonnes) and aluminium exports (-34,000 tonnes). Container volumes were similar with 20,600 twenty-foot equivalent unit (TEU) handled through the terminal (1H24: 21,000 TEU). These volumes were handled on fewer container vessels, 13 in 1H25 (17 in 1H24).

A key factor of the increased bulk cargo is the completion of the Kia Whakaū dredging project, a long-anticipated initiative aimed at improving the port's capacity and efficiency.

A project that dates back to 2022 when South Port was granted resource consent by Environment Southland, Kia Whakaū saw the dredging and removal of seabed materials to 9.7 metre chart datum (CD) in the harbour entrance channel, 10.7m CD in the Island Harbour berth basins, and 9.45m CD in the swinging basin.

The benefits of removing the high points in the channel and increasing the current operating draft by 1 metre have assisted with improving safety margins for ship movements and provided greater capacity for vessels to take on additional cargo.

A major project for South Port that will continue to benefit the region's customers for years to come, the project resulted in significant improvements to facilitate the best logistic solutions, particularly for bulk vessels.

CEO Nigel Gear explains that while large vessels have been calling at Bluff for some time, draft restrictions limited their ability to maximise their load capacity.

"The idea behind the Kia Whakaū project was to gain greater depth, which allows for better utilisation of the existing vessels calling at the port. Previously, we were unable to fully load log and woodchip vessels. Now, with greater draft depth, we can. So, that additional metre has made a big difference.

"This has led to better efficiencies throughout the supply chain, benefiting industries such as agriculture and forestry by allowing for larger shipments and reducing overall logistics costs.

"The project has also offered a lot more opportunity out to the market. And these vessels, as I say, that were already calling, so while it hasn't led to an increase in the size of the vessel calling at the port, it has provided better efficiencies.

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"It's great for everyone: it creates more efficient supply chains, which leads to cost savings, which leads to opportunities for taking more cargo out each time a vessel calls."

Among the benefits being realised:

- A number of woodchip vessels have loaded in excess of 40,000 MT, as a one-port call, that previously required a two-port call in New Zealand before heading to markets in Asia.
- The MSC line's Wallaby service to Australia is loading and discharging additional containers per call.
- Vessels containing bulk agricultural and NZAS imports have greater payloads than were previously achievable.
- More vessels are able to move on both high and low tides.

The Kia Whakaū dredging project represented the first major deepening of the entrance channel, swing basin, and berth pockets at South Port in 40 years. Unlike routine dredging operations that deal with sand and silt, this project required the removal of fractured granite rock from past blasting campaigns in the 1970s and 1980s.

Fortunately, advancements in dredging technology meant that this process could be completed without the requirement to drill and blast.

"We were fortunate that a significant portion of the rock had already been fractured and moved from previous blasting campaigns. This allowed us to remove the material more efficiently, making it a very successful project."

While increased efficiencies gained from the Kia Whakaū project have raised questions about future deepening projects, Mr Gear says any further deepening would require extensive drilling and blasting due to the nature of the rock and therefore significant investment. Any future expansion would need to be justified by a strong business case, likely tied to a specific project or cargo opportunity.

While ship size hasn't changed much in the south, Maritime Union of New Zealand (MUNZ) National Secretary Carl Findlay says that is not so nationally as the size of ships coming into New Zealand ports has increased, as part of a global trend.

However, as New Zealand is a smaller market than many destinations, he says we don't see



the largest modern ships. In addition, New Zealand ports are small by world standards.

"Ports around New Zealand are continuing to upgrade their ability to service larger ships, but MUNZ is concerned about this being driven in a piecemeal and parochial manner by competing ports. MUNZ has called for a national port strategy 'KiwiPort'. Our view is that the current model of individual ports competing for market share has not served New Zealand well.

"The only benefit of this situation is for global shipping lines that play off ports against each other, with duplicated infrastructure leading to inefficient use of resources and destructive competition undermining wages and conditions for port workforces.

"There needs to be a co-ordinated national plan for our ports to ensure they remain held in public ownership as strategic assets, with consideration given to the development of a 'hub and spoke' model with regional ports serviced by New Zealand flagged and operated domestic vessels."

Of greater concern to MUNZ is the many ships visiting New Zealand flying "flags of convenience" that have multiple issues around their seaworthiness and safety, a

problem MUNZ says is acknowledged by the industry regulator Maritime NZ.

"MUNZ has a strong view that New Zealand, as an isolated maritime trading nation, needs to rebuild its own shipping capability, both domestic and regional. This would ensure high-quality vessels, provide reliability and security to the supply chain, and maintain a maritime skill base.

"There is potential for larger vessels to not call at New Zealand ports, and we saw this during the COVID disruption when scheduled services missed calls or were cancelled, leading to serious disruption. A similar crisis in the future could easily see a repeat of this issue. New Zealand is not prepared."





Container movement clarity is breeding mastery for Biosecurity New Zealand

ANDREW SPELMAN, COMMISSIONER, INTELLIGENCE AND SYSTEMS, BIOSECURITY NEW ZEALAND ANSWERS QUESTIONS ABOUT TRACKING AND MONITORING THE COMPLETE JOURNEY OF A CONTAINER.

Was implementing 100% container checks a result of the Strengthening Cargo: Review of the Sea Cargo Pathway report?

Biosecurity New Zealand was already working towards improving container reporting before the review (which can be read in full at <https://shorturl.at/wiCow>). However, the review recommended expanding this work to introduce full reporting. Previously, inspections at transitional facilities (TFs) followed an exception model, where only contamination detections had to be reported. Under 100% reporting, all inspections at TFs must be reported, whether contamination is detected or not.

The change allowed Biosecurity New Zealand to track all container movements, providing a much clearer picture of biosecurity risks from imported cargo.

Is this initiative and the 100% sea container checks for transitional facilities (mandatory from 2021) the same? Both of which are being undertaken through the Container Check Portal (CCP)?

Yes, they are the same initiative.

How long did it take to develop, test, and implement the Container Check Portal (CCP)? Who was involved?

The project was completed over six months, from February to July 2021. During this time, Biosecurity New Zealand worked closely with ports, TFs, and other biosecurity partners to ensure a smooth rollout. An awareness campaign ran through March and April. Training materials were then developed with our training and assessment partners for TF operators and accredited persons (APs), who are employed by industry to carry out biosecurity inspections at TFs.

Can you provide any high-level feedback following its rollout: was it well received?

There was positive feedback about strengthening the AP role and the benefits of capturing more information. Some facilities and APs suggested improving the online guides to make them clearer. TF operators also requested their own access to check AP

records, and some larger facilities wanted business-to-business connections for direct data entry into our systems.

Due to the unique operations of some ports, additional support was needed in certain cases. Biosecurity New Zealand monitored the rollout, offering help to facilities to ensure uptake and resolve any issues. A reference group of external stakeholders was set up to ensure industry needs were well understood.

Why wasn't all data like this collected before this rollout?

Before 2004, physical records of sea container inspections were kept onsite and faxed to Biosecurity New Zealand for centralised reporting. As submission volumes grew, this became unmanageable, leading to the introduction of exception reporting, where only contamination cases were recorded. While this streamlined processes, it left gaps in container movement visibility.

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Container inspection reporting informs New Zealand's import rules for managing the biosecurity risk of sea containers. It also helps Biosecurity New Zealand deploy resources to confirm compliance when risk profiles change for our trading partners. *Photos: supplied*

The CCP was introduced to reduce manual data entry for reporting.

How has collecting this data improved MPI's container traceability? What are these import measures and examples of supporting post-border surveillance activities?

Full reporting has significantly improved Biosecurity New Zealand's ability to track container movements, identify biosecurity risks, and inform regulatory and surveillance decisions.

Container inspection reporting informs New Zealand's import rules for managing the biosecurity risk of sea containers. It also helps Biosecurity New Zealand deploy resources to confirm compliance when risk profiles change for our trading partners – for example, if we identify that a country has a newly established pest. Additionally, the data is used in international forums to support the development of multinational import conditions or rules, ensuring they are risk-based, feasible, and practical.

CCP is described as an interim solution while the “replacement of MPI's Border Information and Communication Technology (ICT) system [is] still 18-24 months away.” What does that mean for the new improvements made to CCP in March 2024 and/or MPI's ICT system? What is your endgame if this is a Minimum Viable Product?

The switch to 100% container reporting in July 2021 involved minimal IT system changes. This

was the “Minimum Viable Product”.

Between December 2021 and March 2024, we replaced our cargo management system with new technology. As part of this, the CCP was completely rebuilt and went live in March last year. It offers the same functionality but is now more user-friendly and has improved security.

The goal was to improve what we could from the legacy system, but the change was essentially a like-for-like replacement.

Future CCP improvements include business-to-business connections for direct data submission, especially useful for large facilities. We aim to have this running within the next few months.

We are also working on providing TF operators with direct access to CCP, giving them visibility over all containers at their TF. This will include new functions like checking consignment status.

Since those changes to CCP were rolled out nearly 12 months ago, has data collection improved? If so, how is MPI utilising this data? Can you give an example (e.g., how many containers are being reported through this portal)?

Data collection rates have significantly improved. Nearly 90% of container inspections at TFs were reported through CCP in 2023 and 2024. The remaining inspections, i.e., those not reported through CCP, are from large facilities with their own reporting systems. These systems are reviewed by Biosecurity New Zealand during regular

performance assessments or on request.

How many educational letters, corrective action reports, or infringement notices have been issued due to unauthorised container movement or reporting failure in the past 12 months?

We identified 35 unauthorised container movements in the year ending January 2025. Of these, 13 resulted in education letters, 12 in infringements, and four in directives to take corrective action. The remaining cases were due to data input errors or other factors.

What feedback have TFs and/or APs provided to ensure quality-of-life improvements are implemented?

As mentioned earlier, the most common requests from TF operators and APs are for CCP to have business-to-business connectivity to reduce double handling of data. This is a priority for Biosecurity New Zealand, along with giving operators direct access to CCP for full oversight of all containers being devanned at their TF.

How has MPI helped improve voluntary compliance with its reporting requirements?

Biosecurity New Zealand had worked closely with industry groups, including through the Biosecurity Business Pledge, to encourage voluntary compliance. Businesses involved in initiatives like the pledge tend to have higher compliance rates and a greater understanding of their crucial role in protecting New Zealand from biosecurity risks.

International trends in raising revenue to fund roads

BY PETER CARR AND NINA ELTER

AROUND THE WORLD, many nations are grappling with the question of how to replace or supplement petrol taxes. The need is pressing.

A general trend towards more fuel-efficient internal combustion engine vehicles (ICEVs), combined with a shift to electric vehicles (EVs) and other zero-emission vehicles (ZEVs), means petrol taxes will supply progressively less revenue over the coming years, in some cases at a quite rapid pace. Countries like the U.S. that have failed to maintain the real value of the existing taxes have added to the problem of asking people to pay differently by also needing to convince them to pay more.

However, the correct, new, way to have the public pay is unclear. What should petrol taxes be replaced with, and how should a jurisdiction go about doing so? What are the options, and what defines a good replacement?

Confronted with these questions, and intending to advance public policy deliberation of them in 2025, a North American policy agency contracted Nina Elter of NEWROAD Consulting, supported by Peter Carr from EROAD Ltd, to undertake a study of international literature on these topics. The purpose of this study was to identify options and provide a framework, first to determine a short-list of alternatives specifically for replacing a petrol tax, in the context of the jurisdiction in question, then to assess those alternatives and provide advice on the best mix and options for moving forward.

The question of options might strike people as strange, given the general trend is towards adopting some form of distance-based charging, whether using tolling technology like in Europe, or an odometer-based system like New Zealand's road user charges (RUC) scheme. However, tax systems are bespoke things, personal to each jurisdiction and political economy.

A variety of alternatives exist, any of which might better suit a particular tax system given what is already there, what the community deems most important to achieve and to protect, and how much adjustment might be needed to accommodate a change in the method of taxing for road funding. And even in New Zealand, as we close in on its fiftieth anniversary, RUC is far from universally beloved.

In terms of generic good practices, Adam Smith defined a good tax as one that is certain, convenient, efficient and fair. Subsequent studies have supported this foundational statement while grappling with unpacking it to reveal and respond to the multi-faceted natures of each of Mr Smith's four principles.

Common questions addressed included the meaning of 'effectiveness', the dimensionality of 'fairness', including the salient characteristics 'equity', and extent to which a tool or suite of tools might respond to various externalities. Newer questions included consideration of the privacy implications, especially of monitoring and assurance for tax purposes in a digital world, and of the challenges of providing for inter-operability and the complementarity of tools and systems, across multiple jurisdictions.

We resolved on seven principles, 22 criteria, and 40 evaluative questions. To start with! The principles and criteria were:

SIMPLE:

the taxpayer should easily know what is owed and how to pay.

ROBUST:

there should be no false positives or negatives; the tax should be hard to avoid and evade; and it should be enforceable.

EQUITABLE & FAIR:

the tax should be transparent and just, deliver horizontal and vertical equity, and be seen to provide a proportionate return to the taxpayer.

EFFICIENT:

the tax should deliver good revenue with low administration and compliance costs; it should inform better decision-making by taxpayers and the internalisation of the costs of those choices.

SUSTAINABLE REVENUE:

the revenue source and the mechanism for tapping into it should both be enduring.

SECURE:

the tax should only draw on the minimum of personal private information needed and be able to keep that information secure and used only for its intended purpose, at all times.

INTEGRATED:

the tax should occupy a defined place in the system, to recover a defined share of revenue, and leveraging other parts of the system to minimise the cost to both the government and taxpayers.

In terms of specific good practices, we identified a variety of lenses for exploring the design and operation of different tools. These varied according to whether they helped understand:

- **The instrumentality of a tool (i.e. how it worked:** e.g. by filing a return or as part of a transaction?),
- **The targeting of a tool (i.e. who it taxed or where in the value chain the tax was applied:** e.g. a sales tax paid by a purchaser and collected by a retailer, or an excise paid by an importer-producer and collected by the state?), or
- **The motivation of the tool (i.e. the rationale or trigger for assigning a tax liability to a person or action:** e.g. user pays for costs imposed, or beneficiary pays for the opportunities enjoyed?).

User-(of-roads)-pays					Beneficiary-(of-access)-pays					
Input-based		Impact-based		Presence-based		Amenity-based		Commerce-based		
Volumetric fuel taxes	Also variable by fuel type, carbon content, and/or chemical composition	Fixed access (registration) charges	Also rates may vary by vehicle characteristics	Per cordon tolls	Also rates may vary by vehicle characteristics, location, and/or point-in-time-of-use	Property taxes	Highly variable by jurisdiction	General taxes	Highly variable by jurisdiction	
Fuel sales taxes		By period of time		Per lane tolls		Fare-box recovery		Special (transport) taxes		
Vehicle/equipment sales taxes		By exception		Per road segment tolls		Parking charges		Development / developer contributions		
KWh taxes		By distances travelled		Within area tolls/charges		Fees		Advertising, floor-space, and air-space concessions		

Appreciation of these dimensions enabled the creation of a taxonomy, a method for categorising the vast array of tax tools. Through trial and error we resolved on two Orders of tools (User-pays, and Beneficiary-pays), five families (Input-based, Impact-based, Presence-based, Amenity-based, and Commerce-based), and (with a little forcing – kilowatt hour taxes are properly just another species of fuel tax) 20 genera, to provide a framework that captures, we think, the many individual species of tools.

Given our objective of identifying suitable replacements – or complements – for the fuel tax, we also considered what, if anything, made fuel taxes good to start with? There were five things: it was paid by road users; it was based on actual road use; it applied to all motor vehicles; it applied to all road use; and it could generate considerable, reliable annual revenues.

The logic of our objective meant that we were not being asked to recommend a major redistribution of the tax burden, so a replacement would ideally need to be user-pays and usage-based. This eliminated beneficiary-pays options, including all amenity and general commerce-based tools, i.e. transport-activity-specific sales taxes (e.g. a tire tax, or a sales tax on motor fuel) remained in the mix, but one-off tax levies or special appropriations for transport funding purposes did not.

Of the user-pays tools, ultimately only two genera were eliminated through the short-listing: traditional point-based tolling, and 'by exception' charges (e.g. for over-weight permits). These could both still have important roles in any total system, but their revenue yields were too low, either in general or after collection costs, to replace or complement fuel taxes at scale.

Criteria and short-lists are all well and good, but there was also the challenge of finding the evidence to populate the frameworks and support the drawing of conclusions. This was less of a problem than we first feared. There is not only a significant volume of literature on tax tools and road funding approaches, available and in English, but it also covered the full gamut of tools, usually with multiple independent sources. New Zealand has produced a good deal of solid, well-considered pieces on fuel taxes, distance-based charges, tolling, road pricing, and registration fees. The U.S., Australia, the United Kingdom, the European Union, and international bodies like the IRF, OECD, and ITF all had significant bodies of work to draw on. Even relatively new US innovations like kilowatt-hour charges and retail delivery fees had multiple studies, some very thorough, as did the Eurovignette time-based licence schemes from the EU.

Perhaps surprisingly, a common finding, particularly in relation to older and more established tools, was that revenue sufficiency was often a good enough reason to maintain a tax. Issues with evasion, equity, administrative efficiency, the impact of effective marginal tax rates from stacked charges on the distribution of the tax burden, and even with evaluating and being accountable for the use of funds, were commented on only infrequently.

Standard practices commonly fell short of possible good practices.

This was less true for newer tools, like distance-based charges or full road pricing schemes, where cost and complexity often took centre stage in any debate, alongside privacy.

Despite this, we found four recurrent 'good practice' themes:

- That tools should have clarity of purpose, function, and expected performance, each tool in itself and in the context of its place in the system.
- That tools should follow logically from established good practices that relate to the different aspects of their performance, like communicating with taxpayers and citizens, how they gather and handle personal and private information and money, and in the design of business processes and taxpayer interfaces.
- That tools should be deliberately tasked to recover fair shares of the cost burden from the various segments of road users and road beneficiaries each is designed to reach.
- That tools should be continuously monitored, regularly evaluated, and recalibrated at need to preserve each's ability to perform its allocated role within the policy determined performance parameters.

From this all, we were able to further conclude that:

- **Distance-based charges** are objectively better than the alternatives, but operating costs, the cost of change, and complexity remain significant issues to be addressed.
- **Kilowatt hour charges** are not a "pay-at-the-pump" solution at all, and come with major costs and caveats.

- **Retail delivery fees, area charges, and fixed access charges** work, but only as supplements and not on a fuel tax equivalent scale.

Furthermore, we found that:

- **Robust, comprehensive cost allocation** is the best foundation for monitoring and supporting equity/fairness goals.
- **The evidence exists** to enable a jurisdiction to implement any tool well, if decision-makers want to.
- **No tool stands alone:** they should neither be expected to do everything, nor be introduced or removed without adjusting the surrounding tools to maintain fairness.

So, where did this lead us in respect to the brief?

Our conclusion was that distance-based charges are the best alternative to fuel taxes. It offers equivalent revenues at marginally increased administration costs, better equity outcomes, and a more flexible platform upon which to (potentially) develop further road pricing interventions.

However, the reality is that fuel taxes still work well for most jurisdictions. If the cost of smart home metering can be borne, or charge data from the vehicle made securely accessible to the tax collector, then introducing a kilowatt hour road tax as part of a suite of fuel taxes could be an effective way of covering the gap in current tax coverage. However, equity issues would remain, not only unresolved, but on a decaying trajectory as the range of vehicle fuel economies (for otherwise similar vehicles) continued to broaden.

From a pragmatic perspective, we concluded that it would make most sense to pursue a phased transition to distance-based charges, starting with those vehicles not meeting their tax obligations through taxes on liquid fuels. Focusing on these smaller populations of vehicles would close the coverage gap and provide experience with which to improve administrative processes before imposing that transactional burden on drivers of ICE vehicles.

Where vehicle policies are pushing the fleet towards wider and faster uptake of EVs and ZEVs, movement onto distance-based charges would be more on an 'opt-in' basis, as people chose to move away from ICE vehicles, and less an imposition made seemingly for its own sake.

	ROAD USER PAYS	BASED ON USE OF ROADS	ALL VEHICLES	ALL ROAD USE	SUFFICIENT REVENUE
Input-based taxes					
Volumetric fuel tax		✓	~	✓	~
Fuel sales tax	✓	✓	~	✓	~
Kilowatt-hour tax	✓	✓	~	✓	~
Impact-based taxes					
Fixed access charges	✓	✗	✓	✓	~
By period of time	✓	✗	✓	✓	~
By distance travelled	✓	✓	✓	✓	✓
Presence-based taxes					
Within-area tolls/charges	✓	✓	✗	✗	✗

And this is the closing point. Across the research we looked at, if the public was asked what they wanted, it was not a more elegant way of paying taxes. They wanted better maintained roads that got them to where they needed to be, safe and on time, every time.

This explains, to some degree, why around the world, tool design and performance often seems to fall short of good practice. But it doesn't justify it.

New Zealand has historically done well in this area. As the Government looks to modernise the system of road taxes and charges, our study shows that the opportunity – and evidence – exists to do well and do better.

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Cook Strait ferries face important challenges in the replacement process

BY JAMES PAUL

The Government will narrow down the shipyards vying to build the new Cook Strait ferries by the end of March. Photos: KiwiRail brand toolkit

THE COOK STRAIT, a vital maritime link between New Zealand's North and South Islands, has long been served by ferries that transport passengers, vehicles, and freight. Over the years, the Government has undertaken various initiatives to modernise this essential service, addressing challenges related to aging vessels and infrastructure.

But recent attempts to address this particular piece in the country's supply chain have gone awry, causing headaches for the Coalition Government.

In 2018, the then Labour Government embarked on the Inter-Island Resilient Connection (iReX) project, aiming to replace the aging Interislander ferry fleet with two new rail-enabled ferries. These vessels were designed to enhance capacity and efficiency, accommodating more passengers, vehicles, and rail wagons.

A contract worth \$551 million was awarded to Hyundai Mipo Dockyard in 2021, with the

ferries scheduled for delivery in 2025 and 2026. However, the project's scope extended beyond vessel procurement; significant upgrades to port infrastructure in Wellington and Picton were necessary to accommodate the larger ships.

By late 2023, the estimated total cost had escalated to approximately \$3 billion, prompting the Government to reassess the project's viability. Following the general election, newly minted Finance Minister Nicola Willis announced the cancellation of the iReX project, citing the substantial cost increase as the primary reason.

She highlighted that only 21% of the total projected expenditure was allocated for the ferries themselves, with the majority earmarked for extensive port redevelopment. This decision was met with criticism from various quarters, including opposition parties and unions, who expressed concerns over potential delays in modernising the ferry fleet

and the financial implications of contract termination.

Maritime Union of New Zealand National Secretary Carl Findlay says the decision to cancel iReX was shortsighted, despite the cost blowouts. He says the landside infrastructure issues could have been reviewed and changes made if required.

"Regardless, the result of the cancellation means years of delay, will cost New Zealand more, and result in smaller, less capable ferries. Rail enabled ferries are essential to maintain the viability of New Zealand's rail network, which is very important for both economic and environmental reasons.

"It is obvious none of this was thought through when the iReX deal was cancelled. As part of the 'blue highway' and an extension of State Highway 1, the presence of a New Zealand controlled public owned operator on the Cook Strait is vital for our supply chain security. The previous

disastrous privatisation of rail in the 1990s should be a lesson.

“That being said, we have had constructive meetings with the Minister of Rail about the new ferries.”

The current Interislander fleet comprises vessels built in the 1990s, which have been experiencing increasing maintenance challenges. Incidents such as power losses and groundings have raised concerns about the reliability of these aging ships. For instance, there have been recent instances where ferries encountered mechanical issues, leading to service disruptions and highlighting the pressing need for fleet renewal.

The problem of a reliable Strait service has been compounded by the privately owned Bluebridge's own reliability issues. This has seen similar age-related and mechanical issues. As recently as February, passengers booked on Bluebridge's Strait Feronia ferry said they were “stranded” after the ship stopped sailing due to an engineering problem.

In response to the cancellation of the iReX project, the Government initiated a new approach to secure replacement ferries. In December 2024, Ms Willis announced the establishment of a new company tasked with procuring two medium-sized rail-compatible ferries, expected to commence operations in 2029. The Government has also invited private sector proposals to explore alternative solutions, emphasising a commitment to cost-effectiveness and operational efficiency.

To oversee this critical project, Hon Winston Peters was appointed as the Minister for Rail. Leveraging his experience and expertise, Mr Peters embarked on a global search for suitable shipbuilders. During a visit to South Korea in early 2025, he engaged with Hyundai Mipo Dockyard, the shipbuilder originally contracted for the iReX project.

Reporting back that Hyundai expressed interest in bidding for the new, smaller ferries and indicated their capability to meet the specified requirements, he stated: “I've got a serious contender back in the ring of potential contenders for the tender for two replacement ferries for the Cook Strait.”

In February 2025, the Government appointed directors and board members to Ferry Holdings Limited, the entity responsible for negotiating long-term port agreements and ensuring the seamless delivery of cost-effective replacement ferries:

- Chris Mackenzie (Chairperson): Renowned for his role in negotiating the buyback of New Zealand's rail assets in the late 2000s and serving as the Independent Chair of



THE PROBLEM OF A RELIABLE STRAIT SERVICE HAS BEEN COMPOUNDED BY THE PRIVATELY OWNED BLUEBRIDGE'S OWN RELIABILITY ISSUES.

the Horizontal Infrastructure Governance Group during the Christchurch rebuild.

- Heather Simpson (Deputy Chair): Former Chief of Staff to the Prime Minister and an economics lecturer, bringing significant experience in executing complex tasks.
- Greg Lowe (Director): An experienced professional with a background in infrastructure projects.
- Captain Iain MacLeod (Board member): A mariner and ship master in New Zealand and the Pacific. Within the maritime community, he serves as a vice president and committee member of the NZ Merchant Services Guild.
- Katherine Rich (Board member): A former politician who has led industry associations and had strategic involvement in various NGOs. She is currently the CEO of Business NZ.

As of March 2025, the government has made a provision of NZ\$300 million to settle claims arising from the cancellation of the iReX project. This allocation covers costs associated with terminated infrastructure contracts and potential break fees with Hyundai. While the exact figures are yet to be finalised, this provision underscores the financial implications of the project's termination.

MUNZ says it has a constructive relationship with the Minister of Rail and, at this stage, is confident that the Minister has a good understanding of the importance of public owned, rail enabled ferries.

“We have not dealt with the new Ferry Holding's directors but they appear to have the relevant range of skills to do the job. In saying that, the process of the cancellation of the iReX ferry project was a national embarrassment.

“Our Korean partners were informed shortly before the announcement by text message. MUNZ called for the resignation of the Minister of Finance Nicola Willis and we maintain this position. We do not see another private operator as a viable proposition for the Cook Strait and we would be surprised if that option is pursued.”

As the country awaits another announcement from Mr Peters by the end of March, MUNZ says mitigating any further ferry cancellations, delays or breakdowns won't be achieved.

“Unfortunately, the only simple way of achieving this was to have continued with the iReX project, and we would be looking at new ferries coming into service shortly.

“Now the only option is to increase the maintenance budget for the existing ferries. Staff will act professionally to ensure safe operations. MUNZ will do our part to keep a close watch on health and safety practices.”

New one-stop approval system hopes to boost economic progress

BY JAMES PAUL



KiwiRail finds its way onto the Fast-track Approvals Act's list with four different projects, including the Lower North Island Integrated Rail Mobility project.
Photo: KiwiRail

TOUTED AS A ONE-STOP SHOP, the Government's Fast-track Approvals Bill was introduced under urgency in March 2024 to try and establish a permanent regime that streamlines the approval process for infrastructure and development projects of significant regional or national importance.

By consolidating multiple approval processes into a single pathway, the Bill (which became the Fast-track Approvals Act in December 2024) seeks to reduce the time and costs associated with consenting, thereby accelerating project implementation. Part of the coalition's plan for its first 100 days in office, the Act aimed to expedite economic growth and address pressing infrastructure needs.

New Zealand's existing regulatory framework often requires developers to navigate

multiple acts and processes before receiving approval, leading to delays and increased costs. These could include a resource consent, notice of requirement, certificate of compliance, licence, permission, clearance, or other authority. The Act addresses these inefficiencies by creating a single process overseen by independent expert panels.

A wide range of projects were submitted to the joint Ministers and whittled down by an expert panel to 149 projects to be included in the Act that included housing developments, mining operations, road construction, energy generation, and aquaculture initiatives.

The projects were selected through a thorough and robust process which included an open application process run by

the Ministry for the Environment, analysis by officials, an independent assessment and recommendations process by an independent Advisory Group, and final decisions by Cabinet.

Of the 149 projects, 98 are located in the North Island with nearly a third of the overall projects being housing and land development. Among the infrastructure projects was one submitted by the NZ Transport Agency Waka Kotahi (NZTA), to develop an efficient and reliable connection between Napier and Hastings.

Called the Hawke's Bay Expressway, the project would improve resilience, capacity and safety. An additional lane will be added in each direction over 24 kilometres to create four lanes within the existing state highway corridor. It includes three to

five interchanges and three to four bridge upgrades between Watchman Road and Pakipaki on State Highway 2.

Interestingly, NZTA has 15 approved infrastructure projects on the list, many of which are to develop rapid transit links, develop new corridors to reduce congestion in certain areas, or construct new four-lane dual carriageways.

The Hope Bypass project involves constructing a 4.2km new highway to bypass the Richmond and Hope townships. The objective is to reduce congestion in Richmond, enhance travel efficiency and reliability, and support housing growth in the area. By redirecting traffic away from urban centres, the project aims to improve both safety and accessibility.

Its only multi-region project is called the End of Life Bridges Programme, which would see the government agency replacing eight high priority state highway bridges that are in an 'end of life' condition. These bridges have structural issues and risks, and it is more economically viable to replace them than to continue maintenance.

KiwiRail finds its way onto the list with four different projects, including the Lower North Island Integrated Rail Mobility project. It is an upgrade of the existing rail network on the Wairarapa Line between Wellington and Masterton, and on the North Island Main Trunk Line between Wellington and Palmerston North.

The goal is to improve interregional rail services, offering better connectivity, access, capacity, and service efficiency. Rail infrastructure plays a critical role in reducing road congestion and providing sustainable transport options.

Additionally, the Avondale-Southdown Railway will complete a long-planned cross-isthmus rail corridor connecting east-west via Onehunga, creating significant new connectivity, capacity and network resilience. It will provide a new public transport corridor and freight bypass from the inner-city Isthmus and complete the missing limb to Auckland's heavy rail network.

For a taste of local government initiatives, the list of projects includes the Tokomaru Bay Legacy Landfill Contaminated Land Remediation Project. Located in the Gisborne district, this project entails the removal of a historic contaminated landfill. The site will be remediated and restored to its original floodplain state, addressing environmental concerns and enhancing local infrastructure resilience.

Auckland Transport has three projects approved in its name: Papakura to Pukekohe Route Protection - Four-tracking and Active Mode Corridor; the Airport to Botany Bus Rapid Transit; and the Auckland Level Crossings Removals.

Port of Auckland has its Bledisloe North Wharf and Fergusson North Berth Extension in the list of approved projects. A new 330 metre long by 34m wide reinforced concrete piled wharf structure will be constructed to the northern edge of the Bledisloe Terminal for roll-on/roll-off and large cruise ships.

A 45m long x 34m wide reinforced concrete piled extension will also be added to the length of the existing Fergusson North Berth to accommodate larger container ships; and the port will also establish a new cruise passenger terminal within the ground floor of the existing vehicle handling facility on the Bledisloe Terminal.

Fendering (and other ancillary structures, as required) will be provided around both wharf structures, in a similar manner to that which exists for the balance of the wharves within the Port of Auckland.

Port of Tauranga wasn't forgotten with two projects in the approved list: the Stella Passage Development and its Capital and Maintenance Dredging Reconsenting Project. The former will extend the Sulphur Point and Mount Maunganui wharves, and carry out the associated reclamation and dredging of the seabed. The latter will remove dredging material from the coastal marine area to deepen, widen and maintain the navigation channels of the Port of Tauranga.

All of these listed projects can apply for a substantive consent application directly to the Environmental Protection Authority (EPA), instead of the now former multi-approval process. Applications will not be publicly notified and there will be no right to lodge a submission, although affected persons, iwi, and relevant ministers and government departments will be invited to 'comment' on the application. There is no requirement to hold a hearing (although an expert panel may choose to do so).

Hon Shane Jones, Minister for Regional Development, says the regions have enormous potential, and the Fast-track projects, freed up from stifling consenting processes, are another "change that is giving them back the wings they deserve".

"The seven aquaculture and farming projects will strengthen partnerships with iwi to boost Māori development and are expected to have an output of up to 143,000 tonnes per annum.

"There are 43 infrastructure projects that will help to address our infrastructure deficit and, among other benefits, result in at least 180km of new road, rail and public transport routes. Having these projects fast-tracked will mean we can continue moving at pace to deliver a new generation of Roads of National and Regional Significance for New Zealand to support economic growth and get people and freight to where they want to go, quickly and safely. The eight quarrying projects on the list will help to enable these and other future infrastructure projects.

"The 22 renewable electricity projects will help electrify the New Zealand economy, boost energy security and help New Zealand address its climate change goals. New Zealand has abundant renewable energy resources but the planning system puts barrier after barrier in the way of taking advantage of them. Collectively the projects will contribute an additional 3 gigawatts of generation capacity, if all consented. By comparison, Auckland's historic peak demand is about 2 gigawatts.

"The 11 mining projects will make a major contribution to the Government's resource objective of doubling the value of our mineral exports to \$2 billion by 2035, extracting coal, gold, iron sands and mineral sands. They will deliver measurable benefits to regional and national GDP, highly-skilled and highly-paid jobs in the regions, and other associated benefits like the retention of regional infrastructure."

Other projects not included on that original list can now make a referral application to the EPA, which will then provide it to the Minister for Infrastructure if it is complete and within the scope of the Act, but they must have significant regional or national benefits.

Minister for RMA Reform Chris Bishop emphasised the economic and infrastructural benefits of the Act, stating that it would "cut through the thicket of red and green tape holding New Zealand back." He underscored the government's commitment to facilitating essential infrastructure projects that are crucial for the country's development.

The Act represents a significant shift in New Zealand's approach to infrastructure and development consenting processes. While it has garnered support for its potential to expedite essential projects, it has also faced criticism from those concerned about environmental implications and the adequacy of public consultation.

As the Act is implemented, its impacts on New Zealand's development landscape will continue to unfold. Stakeholders will also closely monitor the effectiveness of the new system in balancing economic progress with environmental stewardship.

Concrete NZ: The case for concrete roads

BY JAMES PAUL

NEW ZEALAND'S APPROACH to road construction has long been dominated by asphalt, but as infrastructure demands evolve, the question of long-term cost-effectiveness and sustainability has become increasingly pressing.

Recognising the need for a thorough analysis of concrete pavement as an alternative, Concrete NZ commissioned Infometrics Ltd to reassess the case for concrete roads. This report builds on earlier studies conducted in 2013, 2018, and 2020, which suggested that while concrete roads may require higher initial investment, their whole-of-life costs, price stability, and environmental performance offer significant advantages over asphalt roads.

The latest findings reaffirm that concrete pavements provide superior cost efficiency over a 40-year life cycle, significantly reducing both maintenance expenses and financial risks associated with price volatility.

Additionally, the study highlights the environmental benefits of concrete, particularly in terms of CO₂ emissions, positioning it as a more sustainable choice for the country's future road infrastructure.

To test this, 20,000 simulations of road construction and maintenance costs were run, applying results from overseas and New Zealand data. The results were compelling: concrete roads were found to be between 11.8 per cent and 22.9 per cent cheaper than asphalt roads over their full life cycle, with a weighted average cost advantage of 17.5 per cent. This aligns closely with past findings but is now backed by newer cost data and a refined methodology.

While the report primarily focuses on New Zealand-specific cost data, its findings are echoed in international studies. Across multiple countries, concrete roads have proven to be a more financially sound investment over time, largely due to lower maintenance requirements and more predictable pricing.

A 2017 Australian study by Arcadis, which analysed 72 road construction scenarios, found that concrete roads cost 11-18 per cent less to build than asphalt roads and required 43-55 per cent less maintenance expenditure over 40 years, leading to an overall 25 per cent cost advantage. Similar trends emerged from Canada, the United States, Korea,

and India, where whole-of-life analyses consistently favored concrete.

These findings are particularly relevant for New Zealand, given the country's increasing focus on cost-efficient infrastructure investment. A report conducted in 2013 by consultancy firm Opus to understand the Ruakura Development's pavement options for each of its various zones remains one of the few local examples comparing concrete and asphalt roads. It suggested that concrete pavements were, on average, 20 per cent cheaper than asphalt pavements over their full life span, reinforcing the conclusions drawn from the global research.

To further validate these comparisons, the report examined price volatility – a crucial factor in long-term financial planning. Unlike bitumen, which is derived from petroleum and subject to volatile global oil prices, cement prices remain relatively stable. Over the past three decades, asphalt prices have fluctuated five times more than concrete prices, introducing an unavoidable financial risk for government agencies and private road contractors.

Additionally, New Zealand's dependence on imported bitumen heightens this risk. With the closure of the Marsden Point oil refinery, the country now relies entirely on imported asphalt materials, exposing it to supply chain disruptions and cost surges. In contrast, cement is both produced domestically and imported, providing greater pricing stability and supply security.

Beyond financial considerations, the environmental implications of road materials are becoming an increasingly important factor in infrastructure decision-making. Traditional assessments of CO₂ emissions have often pointed to asphalt as the greener option, due to lower emissions during the manufacturing stage. However, these assessments have failed to consider whole-of-life carbon impacts – a crucial oversight that significantly shifts the equation in favor of concrete.

While it is true that asphalt production initially emits less CO₂ per kilometre of road, this advantage is short-lived. The higher frequency of maintenance and resurfacing required for asphalt roads means that, over time, its total carbon footprint catches up to and often surpasses that of concrete roads. When factoring in long-term maintenance emissions, the report finds little to no

difference in total CO₂ output between the two materials.

However, one factor decisively tilts the balance toward concrete: CO₂ absorption, or "carbon uptake." Unlike asphalt, concrete has the ability to absorb CO₂ from the atmosphere throughout its lifespan. According to the Intergovernmental Panel on Climate Change, this natural process can reabsorb 15-30 per cent of the CO₂ emitted during cement production, making concrete a far more sustainable option when viewed over a 50-year life cycle.

In practical terms, this means that a properly designed and maintained concrete road could reduce its total net CO₂ emissions by 35-53 per cent compared to an equivalent asphalt road. Recognising this advantage, the Infrastructure Sustainability Council is now incorporating CO₂ absorption metrics into its sustainability rating tools, which could influence future government procurement decisions.

Overall, the report presents a compelling case for rethinking New Zealand's reliance on asphalt roads. The evidence is clear: when considering long-term costs, price stability, and environmental impact, concrete roads are the superior choice.

The study confirms that while asphalt roads may appear cheaper in the short term, their higher maintenance requirements and price volatility make them more expensive over time. By contrast, concrete roads, though initially more costly to construct, provide significant savings over their full life cycle, making them a financially responsible investment for New Zealand's infrastructure future.

Equally important are the environmental benefits. With concrete's natural CO₂ absorption capabilities, its net carbon footprint is demonstrably lower than asphalt over its lifetime. As sustainability becomes a growing priority in infrastructure planning and policy, the advantages of concrete roads will become even more pronounced.

New Zealand has an opportunity to rethink its approach, prioritising long-term value over short-term cost savings. If policymakers and industry leaders take these findings into account, concrete roads could play a far greater role in shaping the country's transport infrastructure for decades to come.

Community response to transport noise exposure in New Zealand

BY DARRAN HUMPHESON AND KATRINA MAGILL

Environmental noise can harm human health and negatively impact people's daily activities at home, school and work and during leisure.

The World Health Organization (WHO) 2018 environmental noise guidelines recommend maximum admissible noise levels to protect population health, classifying long-term annoyance, impaired wellbeing and self-reported sleep disturbance due to noise as health outcomes. Annoyance response is the most readily measurable and reliable indicator.

Environmental noise caused by transportation can cause a range of disturbances and annoyance reactions among individuals. The threshold at which individuals will be annoyed will vary depending on their expectations and sensitivity to noise.

When combined at a population level, exposure response functions derived from the percentage of people reporting being highly annoyed for a given noise exposure level can be generated for different forms of transport and exposure response relationships can be compared to similar research.

What Tonkin + Taylor and Research New Zealand did

In 2016, a socio-acoustic survey was conducted in Auckland that considered the exposure response functions of people exposed to road-traffic and railway noise. The analysis showed that the percentage of people highly annoyed for a given noise exposure compared well with similar international studies, although in each case, the onset of annoyance occurred at marginally lower noise exposure levels.

The objectives of this second socio-acoustic study were to define and quantify the responses to short-term and long-term transportation noise exposure from road traffic, railways and aircraft. As well as including aircraft noise with study areas defined around Auckland, Rotorua and Queenstown Airports, the geographic scope was extended to include roads and railways outside Auckland. It was identified that there were no new or altered rail or airport projects to qualify as short-term study areas, so only



road-traffic noise was selected for short-term study areas.

This study commenced in 2021 and coincided with COVID-19 restrictions and the subsequent reduction in transportation activity within New Zealand. Socio-acoustic surveys were delayed until activity levels had returned to near normal levels and took place between September 2022 and January 2023. The 2016 survey questionnaire was used and expanded to include time-of-day factors, health and general wellbeing questions, interventions used to reduce annoyance and respondents' views of the noise source and those responsible for the relevant transportation infrastructure.

Sample populations for each mode of transport were identified, and potential

respondents were randomly sampled within those population groups. A total sample of 2,212 completed the survey, mostly on paper, although some completed the survey online or by telephone. A sub-sample of 808 completed the road-traffic survey, 775 completed the railway survey and 629 completed the aircraft survey.

What they found

Road-traffic noise

Road-traffic noise was the most common source of noise annoyance for all respondents, regardless of which sample group they belonged to.

Cont. on page 20

When respondents were asked to identify which noise source currently bothers them the most when at home, 35 per cent said they were most annoyed by road-traffic noise. This was also identified as the most annoying noise by 20 per cent of the railway sample and 28 per cent of the aircraft sample.

When asked about their level of annoyance with road-traffic noise, 20 per cent of the sample reported being highly annoyed (rating 8 or more on the 0–10 annoyance scale). Of those highly annoyed with road-traffic noise, 65 per cent were highly annoyed when inside their home with the windows open, 51% were highly annoyed even with their windows closed and 61 per cent were highly annoyed when at home outside. Two-thirds (66 per cent) of those highly annoyed found the noise annoying both during the week and in the weekends, especially in the evening and early morning (7pm–3am).

Highly annoyed respondents reported that road-traffic noise affected:

- their ability to relax outdoors (37 per cent)
- their ability to get to sleep (31 per cent)
- how much sleep they get (26 per cent)
- how easily they become irritated (26 per cent)
- how stressful or anxious they feel (26 per cent)
- their ability to read, work or study from home (25 per cent).

To try and minimise the noise or its impact, 24 per cent of respondents and 45 per cent of those highly annoyed said they keep their windows and doors closed when at home, while 12 per cent of sample respondents and 30 per cent of those highly annoyed said they spend less time outside and more time indoors.

Around 40 per cent of those highly annoyed by road-traffic noise strongly disagreed that their local council (40 per cent), freight operators (38 per cent) or NZ Transport Agency Waka Kotahi (37 per cent) were doing their best to reduce road-traffic noise affecting their neighbourhood.

Railway noise

When railway sample respondents were asked to identify which noise source currently bothers them the most when at home, 9 per cent said they were most annoyed by railway noise. To put this into perspective, more than double this proportion of the railway sample (20 per cent) said they were more annoyed by road-traffic noise.

When asked about their level of annoyance with railway noise, only 7 per cent of the

sample reported being highly annoyed and 39 per cent said they were not annoyed or bothered. Of those highly annoyed, 66 per cent were highly annoyed when inside their home with the windows open and 42 per cent with their windows closed. Two-thirds (65 per cent) of those highly annoyed found the noise annoying both during the week and at weekends, especially late in the evening/early morning (7pm–3am).

Most of those highly annoyed with the noise reported that their bedroom faced the train tracks (81 per cent), which also explains why the main impacts were to do with difficulty sleeping. In turn, 28 per cent of those highly annoyed reported that noise affects how stressful or anxious they feel (28 per cent) and how easily they get irritated (25 per cent).

Just over one-third of those highly annoyed strongly disagreed that their local council (34 per cent) or KiwiRail (38 per cent) were doing their best to reduce railway noise affecting their neighbourhood.

Aircraft noise

When asked to identify which noise source currently bothers them the most when at home, 30 per cent of all aircraft sample respondents said they were most annoyed by aircraft noise. However, a similar proportion (28 per cent) of aircraft sample respondents were most annoyed by road-traffic noise.

When asked specifically about their level of annoyance with aircraft noise, one in four of the sample (24 per cent) reported being highly annoyed. Of those highly annoyed with aircraft noise, most were highly annoyed when inside their home with the windows open (81 per cent), although 63 per cent were also highly annoyed even with their windows closed. Aircraft noise was considered to be annoying both during the week and at weekends, particularly so in the evening and early morning (7pm–7am).

Many impacts were noted with regard to aircraft noise, particularly among those who were highly annoyed, including:

- their ability to relax outdoors (47 per cent)
- their ability to listen to music, the radio or TV (46 per cent)
- how easily irritated they get (44 per cent)
- their ability to get to sleep (42 per cent)
- how stressful or anxious they feel (35 per cent)
- their health and wellbeing in general (35 per cent)
- how much sleep they get (33 per cent)
- their ability to read, work or study from home (33 per cent).

To try and minimise the noise or its impact, 23 per cent of respondents and 54 per cent of those highly annoyed stated they currently keep their windows and doors closed when at home. Others said they spend less time outside when they are at home (9 per cent of all people sampled and 23 per cent of those highly annoyed), while 19 per cent of those who are highly annoyed are planning to move from the area altogether.

Almost one-half of those highly annoyed by aircraft noise strongly disagreed that their local council (47 per cent), airport company (45 per cent) or airline/aircraft operators (49 per cent) were doing their best to reduce the noise from aircraft affecting their neighbourhood.

Conclusions

The findings of the study can be extrapolated to the New Zealand population exposed to transport noise on the basis that the wider exposed population have on average the same opinions as the sample population.

When compared to the WHO 2018 guidelines, the sampled New Zealand population is more sensitive to road-traffic noise, is less sensitive to railway noise and has similar sensitivities to aircraft noise. The study's findings for road-traffic and railway noise are comparable to the findings of the previous New Zealand study.

Socio-acoustic studies have consistently shown that a person's sensitivity to environmental noise varies considerably, that exposure response functions differ depending on the source and that attitudes are also related to non-acoustic factors.

Differences could be due to changes in attitudes towards the source of noise, changes in noise exposure, differences in the cultures of those being surveyed, differences in study design, implementation or measurement or a combination of these factors. The WHO 2018 guidelines identify that, of the three sources of transportation noise, aircraft noise invokes the highest exposure response followed by road-traffic noise then railway noise.

The studies used to inform the WHO 2018 guidelines also show that there are geographic variations in exposure response functions for the same source of noise, which include country/cultural differences.