Feedback to the NZ Infrastructure Commission - Te Waihanga.

Dear Ross Copland, and honourable members of the NZ Te Waihanga,

2nd July 2021

From: [redacted]

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Who am I, and why am I qualified to give feedback?
I'm a NZ citizen, 63, and have lived in Ruby Bay, Nelson for 30 odd years. For work, I have been involved with commercial and residential buildings and development in many cities in NZ, but mainly in Auckland Nelson and Tasman. I have a BSc in Electronic Eng from the Uk, have been studying doctorate Climate papers for 30 years in an amateur capacity, and I am the author of [redacted] Member of Zero Carbon Nelson Tasman, Nelson Tasman Climate Forum (Transport Group), and the Green Party, among others. I wish to make comment on your Paper from the perspective of Transport in NZ today.

I have a large long term collection of scholarly scientific climate reports and the 2014 IPCC manual corresponding to their AR5 report, and I have a deep understanding of our climate system. I've had discussions with many climate scientists directly, including those working in the Arctic and researching methane release in the ESAS north of Russia. We are all in big trouble.

Context of NZ's situation (also the answer to Q1).
I understand that our national infrastructure is in dire need, and your Paper is doing its best to attend to the issues in a rapidly changing world. Being a member of our NelsonTCF Transport Group and an author on climate issues, I would like to clarify some important contexts going forward.

The Paris Agreement, which prior NZ governments have chosen to more or less ignore so far, is 5 years old and was based on information held in the IPCC's AR5 report from 2014, now 7 years old. The AR5 made some mistakes in prediction, largely due to the functioning of "hindcasting" in models, and the insufficient attention given to various fast-moving global climate feedbacks which could not be modelled. The largest of these is the potentially devastating feedback of methane emission from thawing Northern permafrost and the shallow Arctic ocean, the ESAS, and others are also very serious for humanity. I need to be brief. The result is that the IPCC's AR6 out next year is likely to mandate at least 45% reduction of all carbon emissions by 2030, not 2050. There is a very sound scientific argument to actually just cease all carbon emissions immediately, but of course we can't do that. Please read this report on the paleo record relating to CO2 levels and climate over the last ice age and back 50 million years - it is highly relevant.

https://www.theatlantic.com/magazine/archive/2021/03/extreme-climate-change-history/617793/

Our "Net-Zero by 2050" law is too slow for the Paris Agreement, and the Paris Agreement is too slow for the AR5, and the AR5 is also too slow for the raging feedbacks coming. Our current CO2

level is equivalent to that of 3 million years ago, and a sea level 20-30m higher than today's. And we make it worse every day. We watch the signs of rapid "Climate Evolving" every day in the media. We no longer have time for "by 2050" whatever the economists and politicians say.

We also have an added problem in NZ. Our overall carbon emissions are 25% above 1990 levels, with our transport emissions being 90% above 1990 levels. This is highly embarrassing when Europe has achieved 25% BELOW 1990 levels. It is likely that the European Carbon Border Adjustment Mechanism (new high import taxes due to our very lazy carbon profile - cars and cows) will come into effect soon, heavily punishing us for not "Acting" on limiting vehicle emissions. This could easily become contagious in World Trade circles, locking us out of many exports. The Ford Ranger is the prime target, along with all other popular large utes and SUV's. Shame on us. These vehicles need to be blocked now, not in 2035! All this has a bearing on planning of infrastructure.

We have a genuine Climate Emergency, and an emergency requires rapid responses before the house burns to the ground. Unfortunately for the NZ public, govt needs to bring in several uncomfortable sticks (see Suggestions below), rather than just a few pallatable carrots like the $8K discount for expensive new EV's. The alternative is climate chaos getting worse for everyone everywhere from now on for at least centuries, and there is no guarantee this will not happen anyway due to global climate inertia and so many governments already buying time for 30 years. Below 1.5C is the mantra, but currently we are heading for 3.5C this century, and anyway there is no temperature stability indicated in the paleo record at 1.5C, or 2C, or 3.5C. Just feedback-led heating over short millenia to Earth's other stable state - the HotHouse, +10C. This potential Earth system planetary change is also explained in this scientific article from 2018:

https://www.pnas.org/content/pnas/early/2018/08/07/1810141115.full.pdf

The "Global Warming" currently happening, primarily due to all our engines, is happening at a rate unprecedented in the paleo record, and could lead to Earth having a dramatically lower carrying capacity for life, quite soon, as has happened before. The global leaders making the decisions during the 2010's and 2020's may be those to blame for a "ghastly future" more or less forever. It is worth all MP's getting a proper understanding of how the Earth works, and the way carbon is pivotal. Coal, gas, petrol, diesel, jet-fuel, concrete and steel must all reduce. Fast. Everywhere. Sorry.

We are witnessing a dramatic rise in extinctions worldwide, also amounting to a Biodiversity Emergency. This report, just months old, shows the sort of trouble we are in:

https://www.frontiersin.org/articles/10.3389/fcosc.2020.615419/full#B118

I quote two highly troubling statements from this report:

"Humanity is running an ecological Ponzi scheme in which society robs Nature and future generations to pay for boosting incomes in the short term", and

"The predominant paradigm is still one of pegging "environment" against "economy"; yet in reality, the choice is between exiting overshoot by design or disaster".

Without understanding the seriousness of these issues, or planning for infrastructure changes without heed to these issues, it is quite likely that NZ, among many other countries, will be overwhelmed before planning is carried out properly, with regard to sea level and storm, drought and fire, while continuing to make the global situation worse. The overall necessity is to **cease all combustion as soon as possible**, and this needs to be the focus beyond any other. It will not be easy. Various current values, like Health and Safety, the "Just Transition", equality and housing, may well not keep up. The infrastructure we have currently may well be most of the infrastructure that we ever have for a very long time.

Your Paper questions answered.

I choose to save some time here and answer just transport related questions.

Q3. Although I agree with much of this section, I think the dangers have been underestimated. We need to focus on reducing emissions rapidly, that means firstly cars and cows and then planes, ships, trucking, and concrete and steel use. This means NO MORE roads or motorways. Every new road just encourages more car use, and is NEVER a solution to congestion. Quite the opposite.

Q4. "Building a better Future" is simply wishful thinking designed to appeal to people. We are already living in a better future, but at fantastic cost to our own actual not-so-far-away future. The carbon pulse we aggravate every day could take Earth 20 million years to recover from! It needs to stop. I accept that most people don't understand this, perhaps don't agree with it, or simply resist the idea of the ending of perpetual economic growth. When transport and economics of all types both start to decline, we will not be living in a "better future". It will be shocking and hard.

Q5. I submitted to the Ministry of Transport recently, with great enthusiasm for a Smart Road User Charging algorithm, that gradually increases the cost of distance to all road users, especially high distances, and involves much higher charging for higher emission vehicles. Lots of other things could be included, with monthly charging to every vehicle owner. More on this below, but I believe it could make a huge difference to all of this in one fell swoop. I am working on the algorithm myself, and am in touch with software engineers.

Q14. Population. This is a topic that contributes to traffic congestion, and the housing crisis. With our "so-far" success with Covid-19, the whole world can see NZ as a blissful little country at the bottom of the world that looks like Lord of The Rings. In 2018 it was recorded that there were 700 million people in the world who wanted to leave their country due to war, or food or water insecurity. And now the pandemic suggests that this figure could easily hit a billion soon. Immigration into NZ is already very hard to manage with our housing shortage. Infrastructure planning depends on a population projection, but the culture is changing. We need to be very careful about allowing our population to grow, via immigration, from now on. As soon as the borders "open", the pressure will be on, and we can't afford more pressure on our housing for several years. By rapidly and forcefuly reducing travel of every sort (that is almost all FF based), congestion in general will decline and travel will become so expensive that every journey will need to be reassessed, especially flying.

Q19. A national Smart Road User Charging system would be able to be tweaked in many ways, targeting congestion and high use/emission vehicles, and would work using GPS everywhere, tracking every vehicle with its Vehicle ID, as is already used, never the driver. So, all of NZ.

Q20. It would be easy to build in to such a system a free annual low band of distance per vehicle, and free public transport passes all for those disadvantaged. The main thing would be design it well to avoid loopholes and cheating, make enforceability workable, and catch all ICE vehicles, and then all vehicles in the end. This will bring NZ's carbon emissions from transport way down, and negate any need for any new roads. Life will be different, and slower. Travel will be SLOW or very limited. Tourism, local or international, will be history.

Q23. Digital services and Freight supply chains. I disagree with almost everything in C5. Yes this is how it has been under classic globalisation and expansion and economic growth. All of it is powered by fossil fuels with absolute disregard for emissions, only for international trade and economic growth using import and export systems. Much of this will be stalled under any radical fossil fuel reduction. Freight volumes and int. trade in general must fall massively, the Earth cannot afford this level of converting natural resources into waste any longer, either in terms of "what can be sustained", or pollution, or CO2/methane emissions. Populations will soon learn to accept a much lower level of consumption, of stuff, of travel and of general expectation. We cannot

maintain current levels of any of this with such an urgent need to stop emitting. It won't be easy, but the alternatives will be worse. Humanity arrives at being stuck between a rock and another, that we cannot invent our way out of. Hopefully digital services and working will be able to maintain some non-travel economy.

Q24. There is no way that much of NZ's current coastal infrastructure will survive a 5m rise in sea levels. Current projections suggest that a pulse of large-scale glacial melting is very close, (perhaps a "heat-dome" over Greenland), with the rate of warming unprecedented in the paleo record, and accelerating every year. The fastest sea-level rise measured to date was about 15,000 years ago at the end of the last ice-age, when the sea was rising a metre every 20 years, or 50mmpa. Currently it is 3.5mmpa, but there are signs this is likely to change fast quite soon. How much is the first 5m of coastal land worth? Buildings, homes, ports, infrastructure, city centres, roads pipes and river frontages. Huge. It is all under threat if we don't cease our emissions very quickly. Large scale national and international refugees will be next. Big trouble. There is nothing "better system" about any of this, and it all hinges on reducing emissions asap, whether farmers and Ranger drivers like it or not.

Q25/26. NZ is well-served by institutional settings, but we have a sea-change closing in on us. Some of it will be new regulation, such as the carbon thing, some of it will be direct climate-related changes, some it will be effects of mitigation attempts (like the smart RUC system) or just serial adaptation. Unfortunately, I think many in NZ are not in touch with the seriousness of the situation, so these ongoing changes will be shocking. Democracy and economics are not well-served to manage steep reductions or steep regulations coming from overseas (the IPCC). I have a list below of suggestions made in several submissions for national and local government to consider.

Q35. Clearly the use of concrete and steel needs to significantly reduce, not by 5% but by 70% or more. We have plenty of timber, which mostly we seem focussed on exporting. Construction using laminated timber is good for 12 stories now. Concrete and steel need to be forced into a sinking-lid quota system and squashed right down, they are both very high emission materials. And we can't just replace all our vehicles with EV's either. Travel expectation must change completely. Embedded carbon is a further terrible consideration of all our trade in and out.

On a national Smart Road User Charging system. (that will remove the need for new roads).

This C3 is the section of your Paper that excites me the most. I have been considering ways to reduce traffic for decades, while it increases everywhere to the point of bursting, and have come to the conclusion that smart distance pricing is now the answer, and gives the opportunity to include various other useful charging systems. The innovation capacity is ready, and already widely used in a different guise.

Simple carbon tax added to excise duty is a blunt instrument and likely to be unpopular. Removal of subsidies, effectively the same thing, in other countries has often resulted in riots, as everyone is affected negatively on the same day, as would happen with a big petrol/diesel price jump.

Smart charging can be brought in gradually as vehicles are upgraded, and the charging can be stepped for distance bands, engine emission rating (car type), included carbon taxes, fines and congestion charges, monitored continuously with GPS (becoming compulsory with time), and are all adjustable at source. Charging itself can be monthly to the registered owner of every vehicle, and itemised like a power bill now. EV's and fuel-cell cars may be exempt for distance charging for a while, but they cannot remain exempt. With one eye on the Just Transition, every vehicle could have a small free mileage per year, say 5km/day or 1500km per year, with staggered start dates per make or Wof perhaps. Average car mileage per year is known already via the WoF system, so squeezing the "average car mileage" down is a matter of Road Distance Charge bands, with high mileage getting charged very highly. This charge is also linked directly to the vehicle emission

rating (engine type size and age), which could be very high for large ICE engines, and not small for hybrids with large ICE engines.

The smart system would track every vehicle using it's digital ID and GPS, as already happens with traffic jam management in cities using cell phone movements. No need for number plate cameras beyond the short term. This system already tells the driver about the vehicle's speed and location, and the speed limit, in most new cars, so no need to identify the actual driver, just the vehicle. Congestion charges near urban centres or school zones would be simple to add and vary. New roads (like Transmission Gully) would be very expensive to use (and build), discouraging the government from building any more new roads. Every private, business or govt vehicle journey would become directly chargeable, depending on many factors run by a simple algorithm, or App. The App could link with certain other vehicles by choice, in a number of ways. We have the technology already. Currently RUC runs at about 7c/km for private vehicles. It is way too cheap, evidenced by the congestion in so many cities, and carbon tax can be included. This does not need to cost the Earth to bring in, but could cost the Earth not to. It could also easily become standardised worldwide, so the race is on to develop it. In the circumstances I don't see why government cannot just decide to bring it in without need to ask the public, but the system needs to be designed well. Existing RUC included in petrol would be taken out and separated into the App, and diesel for all off-road use would have running hours chargeable to every engine by rating - construction, farming, industrial, mining etc. Off-road enforceablity is a different question that needs attention.

The system would need a functioning GPS system in every vehicle which includes the vehicle ID, and older vehicles can be brought in gradually, with a looming deadline like Healthy Homes, and tested at every Wof. All the chargeable information would be held in a central system, accessible or held slave by each vehicle's App. Vehicles would need a zero or low balance to achieve a Wof. Old vehicles will also need exhaust testing at Wof time, with failures automatically written off. Any vehicles on the road strongly out of Wof for certain reasons would be impounded and scrapped, as scrapping older ICE vehicles will become a priority for this country.

Given that transport emissions reduction will become more urgent very soon, involving necessary rapid public behaviour change, I think this system of smart distance charging etc, is the golden key to "45% reduction by 2030". This of course will be followed by "Net Zero (or even ZERO) carbon emissions by 2035", taking us down at least another 25% over the next 5 years. It will be quite shocking, given that our April 20 lockdown only managed a 17% reduction, and car/ute/SUV travel is the major problem. EV's are not the answer either, we cannot just replace all our ICE's with EV's. Soon there will be limited need for more roads anyway, just bus and bike routes.

Distance charging also needs to be adjusted up for all types of heavy vehicle and brought in for all passenger flying linked to emissions per km per seat per aircraft rating and carbon pricing.

Disconnects (and business pushbacks) now in contention.

In New Zealand, and also globally in the "West", we have a seriously difficult set of disconnects and cognitive dissonance, parts of society and businesses that assume growth is a necessity and has a mandate from the markets. Covid-19 is "an irritant to the progress of growth". But with resource use now tracking 1.6 Earth's every year, and the CO2 story as above, our human society must change radically and fast. We will be forced to anyway by Nature whether we choose to or not, but if we choose not to heed the warnings, the pain will be closer and worse. We need to move fast, now. No more delays.

Most of these disconnects involve widely-held expectations that desparately hold on to existing ways of doing things, and capitalist and corporate mandates of "growth", that will rapidly become unable to be sustained in the context of 45% or 75% reduction in carbon emissions.

Aviation expectations and international travel and tourism (inc students and love-miles).

World Trade Organisation, trade expectations and deals.

Global / National Freight supply chains and delivery expectations.

Masculine status around power and engines, especially in NZ and Aus.

Construction using concrete and steel, during a housing crisis

Believing it is ok to aim to reduce to net-zero "by-2050", 29 years away

Food and energy supply is important, all else is less important

Health and Safety is all an illusion - nothing is ever safe, and it costs so much carbon

Immigration expectation in a time of mandatory reduction

The enforceability of trade rules vs climate rules need to be reversed

Embedded carbon has been ignored throughout this debate, and is HUGE. Every newly imported vehicle, EV or ICE, old or new, has a high embedded carbon rating. Every building and road has a huge carbon cost. Most of our retail. Replacing our whole transport "fleet" of ICE's with EV's is dreaming, The answer is SLOW travel or NO travel. The infrastructure we have is what we will have.

AND: Our "by-2050" legislation conflicts directly with the IPCC's "by-2030" coming.

We are all in big trouble.

Suggestions for moving forward now:

For new government initiatives and legislation:

1. An effective and rising carbon tax as a price signal that fossil fuel use MUST now reduce
2. A smart Road Distance Charge App designed to reduce travelling distances in general
3. Ramp down and end the importing of any combustion engines by 2025, we have enough
4. Ramp down the importing of petrol and diesel, and put a ban on all ICE vehicle advertising
5. Restrictions on new road building, funding transferred to all types of public transport
6. A take-off tax per seat for all planes, say $30, plus a flying distance tax, say 10c per km
7. A general tightening in use of combustion-engine trucks and light commercial vehicles
8. Assuming the food system maintains a status quo, all other uses may have to drop faster.
9. Recreational fossil fuel use to be ended soon, eg all combustion engine sports banned
10. Massive subsidies for all EV's, e-buses and e-trucks in the short term to turn the tide
11. Strongly tighten immigration - the biggest source of our growth but also of emissions rise
12. Limitations (quota?) on the use of new concrete and steel, often local timber is better
13. Urban development criteria must change to design for very low travel and electric eveything
14. Recognition that the RMA has become horribly wasteful of resources, and therefore carbon
15. Rapidly tighten dairy quota, heading towards 50% reduction of cow emissions by 2030.
16. The end of fertiliser for dairy farms - the land can be horticultural with city recycled fertiliser
17. The end of coal, and coal boilers drying milk, and a significant drop in milk powder exports
18 The end of palm imports for stock feed, and tropical hardwood too
19. Zero offshore mitigation permitted - it is simply an unfair excuse to continue emitting
20. Recogniton that tourism as we knew it, pre-Covid, may well be history.
21. Recognition that we can't just replace all ICE cars with EV's, travel expectation must drop
22. Clearly, everything possible must also be done to assist those less able to manage

23. Yes we have a Treaty, but we have a global emergency that is affecting all societies
24. Lastly, we need a comprehensive national education campaign explaining the urgency

And encouragement/enforcement to all Local/Regional Councils:
1. Rapidly increase city centre living densities and heights without any space for cars
2. Reduce or end “subdivisions” spreading over the land that encourage car-use
3. Increase pedestrian-friendly car-free zones in all town and city centres across NZ
4. Increase Park-and-Ride and Congestion Charge systems with reduced carparks in centres
5. General commuting-by-car discouragement, with increasing road closure to cars
6. And obviously, a major effort on buses and safe bike paths in all cities
7. Recognition that all travel distance expectation must fall - commuting holidaying etc
8. Councils’ Climate policies have been hamstrung by a lack of government leadership

Thank you for the oppotunity to submit on this Paper examining Infrastructure.

Nga Mihi,
[redacted]