

**Submission in response to:
Inquiry into the future of inter-regional passenger rail in New
Zealand**

Engineers for Social Responsibility Inc. (ESR) is an independent group of engineers who consider that being knowledgeable in the field of technology means that they also have a special obligation to the public at large in matters that relate to engineering, or that can be addressed using engineering approaches. Given the urgency of the issue, for some time now the organization has been particularly focused on how to respond to the climate crisis by reducing emissions and concentrations of greenhouse gases in the atmosphere.

The key authors of this report are members of ESR with strong experience and qualifications in engineering as well as transport.

Passenger rail in underserved communities, those with prior rail links that have been disestablished, and those currently advocating for improved rail links

The railway network of New Zealand had its greatest extension in 1953 with more than 5500 km according to www.teara.govt.nz, but already looked very impressive 100 years ago in 1920 as can be seen below.



What had been started in the 19th century before the invention of the motor car served the needs of the growing New Zealand very well. With the proliferation of the private motor car during the second half of the last century rail transport lost its importance for a number of reasons and emotions:

- Petrol and diesel were perceived as cheap and individual car travel was seen as relatively affordable.
- The connection between the burning of fossil fuels and the damage to the environment and people's health was not as obvious as now.
- Being in charge of a motor vehicle belonged to an individual's freedom.
- People identified themselves by the car they drove.

Today, there is a list of very valid reasons to re-establish a well running rail network in New Zealand, as it is also hinted by the terms of reference of this inquiry:

- In 2020 the New Zealand parliament declared a climate emergency, acknowledging the need to reduce CO2 emissions. The superiority of rail solutions and especially electric rail transport in having the smallest carbon footprint has been demonstrated in many studies. We like to reference here a New Zealand study by the Sustainable Energy Forum, SEF Submission: New Regional Landfill at Wayby Valley (<https://www.sef.org.nz/papers.html>).
- Waka Kotahi NZ has declared a vision of a New Zealand where no one is killed or seriously injured in road crashes, and a target for reducing annual deaths and serious injuries by 40 percent by 2030. Shifting both freight and people trips from road to rail (a lower crash risk mode) will assist in achieving that goal. The New Zealand population is also ageing and many older drivers keep driving because of a lack of convenient public transport options.
- Covid 19 has demonstrated the need for greater resilience as a country and less dependence on international supply chains. If a local industry to manufacture and maintain a railway track network and rolling stock would be supported, then there would not only be benefits to the local economy and the skilled labour market, but also a great reduction in transport fuels, especially through electric rail.
- With the growing population of New Zealand investments in the extension and maintenance of the transport infrastructure are required. Considering the three bullet points above, this investment should be channelled towards public transport.

Viability of passenger rail sitting alongside KiwiRail's freight network

The integration of passenger rail and freight services is quite feasible and already exists in New Zealand. It typically requires signalling improvements to minimise the risk of collisions, and passenger trains designed to be able to share tracks with freight trains. Capacity improvements such as passing loops are also likely to be required to provide time slots for the safe passage of passenger services between freight services and to enable passenger services to be introduced on freight lines without disrupting freight services. Double tracking of some sections of single-track lines with planned higher frequency services will be necessary and it is essential that sufficient width rail corridors widths be retained in key locations for that purpose.

It is noted that in some European regions light rail is able to mix safely with heavy rail through the implementation of Automatic Train Protection (ATP).

Existing inter-regional passenger rail, such as the Capital Connection, and how these services work between local and regional councils and central government

We don't see any technological challenges in this query. Administrations at local, regional and central government levels have to come to arrangements on how to share cost and income. Examples can be seen overseas even in countries with a federal layer in between local and central government (e.g. Germany).

Integration of regional rail into existing local public transport networks

To be successful, regional rail services require stations which are well-located and which enable passengers to transfer between local services and the regional rail network.

Ideally, the regional services should be able to directly access stations located within the centre of towns and cities served. Unfortunately land previously set aside for centrally located stations or for rail tracks into urban centres has been lost in some cases. However, where such opportunities still exist it must be ensured that they are protected so they can be utilised in the future when or if required.

Opportunities for new stations should be investigated and land acquired or protected. These may include stations integrated with new land development as well as station locations that provide good opportunities for bus/rail and mixed land use activity integration. Park and ride can be a good option for outer urban or rural areas.

Climate and emissions reductions possibilities of passenger rail, and how this links to VKT (vehicle kilometres travelled) reduction targets in the Emissions Reduction Plan, and including electrification between regions

The science is clear, electric rail transport powered by renewables has the smallest carbon footprint per person per km of known and tested transport options as demonstrated in the Sustainable Energy Forum submission referred to above. Even electric vehicles have considerable embedded emissions in their materials and contain batteries with currently costly recycling options. They also congest the roads and are involved in accidents. We are therefore of the opinion any new investments in New Zealand's transport infrastructure should be prioritised towards electric rail at all levels, light rail, inter-regional rail and freight. The reductions in VKT and emissions through mode shifts and size of the investment can be estimated, but are dependent on a number of assumptions of the future. We recommend a 'build it, provide it and they will come approach'. Having the infrastructure option available will not only create the mode shift and therefore the emissions reduction but the permanence of transport infrastructure that will encourage the appropriate long term intensification of land use around the rail stations and tracks that will induce the demand.

We advise simply to put investments where the greatest savings in emissions can be made to optimise the use of public money.

Rail expansions and investments in specific areas, such as Tauranga ([following a recent report on the re-introduction of passenger rail](#)) and the Lower North Island ([following a business case funded at Budget 2021](#))

An Initial focus on passenger rail serving the Tauranga-Hamilton-Auckland triangle makes a lot of strategic sense. To improve the attractiveness and viability of these routes, investigations are required to:

- identify and, where necessary, protect suitable station locations, and
- identify track improvements to reduce travel times, improve service reliability, and accommodate increased service frequency (freight plus passenger services)
- also provide viable first and last kilometre access options (e.g., smaller and local shared shuttle bus circuits to stations and improved walking and cycling infrastructure to rail stations) which are equally important to the rail investment itself. Shared on demand services can also be used in outer urban or rural areas where the request for fixed schedules is currently too low.

In addition, it would be desirable to consider also routes, where some planning had been done already like an extension north towards Kaitaia and between Hawkes Bay and Tauranga.

More generally, we would like to see a strategic study of how and where investment in electric rail can contribute to the transition towards a net zero carbon transport system.

List of recommended action points

Based on our above statements we would like to recommend the following actions:

1. General commitment by government to prioritise investment in an electric rail infrastructure with supporting local industries ahead of road transport.
2. Generation of a priority list of which tracks and stations would return the greatest and speediest benefit countrywide considering traffic volumes and capital investment.
3. Ensure the protection of existing rail corridors including existing station sites
4. Investigations into new stations. Urban station locations should ideally be centrally located and/or designed to permit good access and integration with local services and intensified land use activity. Park and ride opportunities should be investigated for appropriate outer urban and rural areas.
5. Investigations into cost-effective options such as passing loops and upgraded signalling to facilitate the safe introduction of passenger rail services on freight routes.
6. Commission a strategic rail study of how and where investment in electric rail can contribute to the transition towards a net zero carbon transport system. This study should include an assessment of impact on emissions and the economy of any investment envisaged.