

**Land Transport Funding Summit
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**RESEARCH FINDINGS LAUNCH:
“IDENTIFYING THE VALUE OF LONG DISTANCE RAIL SERVICES”**

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INTRODUCTION

1. Our research project

Presentation of this paper marks the launch of the findings of a research project.

The reason for the research is the perception that long-distance passenger rail services (including ‘outer’-urban, such as between larger centres and surrounding freestanding settlements) is not adequately covered by New Zealand’s land transport funding system. The aim was to research good practice elsewhere in the world, to compare this with New Zealand practice, and to draw conclusions.

In order to ensure our paper was soundly based, we obtained peer review input from the *Institute of Transport Studies* of Leeds University, England. This is one of the leading international sources of knowledge on transport planning. Chris Nash, who peer-reviewed and contributed comments to our earlier drafts, is Professor of Transport Economics. He was assisted by James Jackson, a researcher undertaking a doctorate in this area.

We would also like to acknowledge the support of the *Victoria Transport Policy Institute* in British Columbia, Canada. This is well-respected internationally as one of the world’s leading research institutes in the transport policy area. It is particularly known for its *Travel Demand Management Encyclopedia*, and for its application of economics to the area of travel demand, an area of growing importance as our world grapples with how to reap more benefit from a given supply of transport, rather than simply build more infrastructure. Its Executive Director Todd Litman has kindly agreed to host our comprehensive and referenced main paper *Identifying the value of long-distance rail services* on the Institute’s website, www.vtppi.org.

Our research predated the imminent take-over of rail operations by the government, but its publication at this time is topical. Labour and National politicians have expressed open-ness to investing in the country’s rail services (once in public ownership), but a sound methodology is needed to guide the quantum of that investment, and how it is allocated.

2. Public interest

Many of us remember the public outcry when Toll NZ announced the impending closure of the *Overlander* – the last long-distance passenger rail service in the North Island. ‘Bright ideas’ for revived rail services now abound, but clear-headed thinking is needed to rationally respond to them.

The *Overlander* has been extolled as a ‘must-do’ trip in TV’s *Getaway*, and *Billy Connolly’s World Tour of New Zealand* – to an international audience. The impending closure issue reached Parliament, where reaction varied from lukewarm to enthusiastic.

3. Cultural mindsets

Although New Zealand has been Roger’s home since 1995, and Don’s since 2003, we are both from the homeland of Thomas the Tank Engine and Paddington Bear, where rail is deeply embedded in the national culture. Where passenger rail between cities is taken for granted, and springs to mind in transport choices. This is not the case in New Zealand!

A few years ago, Roger travelled from Hamilton to speak at Conferenz events using the *Northerner* night-train, which came through Hamilton at about 6.00am, and got to Auckland at about 8.00am. Slightly longer than driving, but ideally timed, far more relaxing, cheaper, directly into the heart of the city centre, and no motorway congestion parking hassles. **Why, then, was he so unusual in doing this?**

Roger also once caught the *Geyserland* from Hamilton to a Rotorua conference, again ideally timed. Concerned Hamilton colleagues said he shouldn’t need to do that, and that so-and-so who was driving to the same conference could give him a lift. Yet the *Geyserland* gave him precious relaxation and presentation-reviewing time over a coffee, as well as being cheaper than sharing petrol. **Why, then, were Roger’s colleagues so concerned?**

We suspect that habitual mindsets are one reason long-distance passenger rail has been ignored or downplayed for so long in New Zealand land transport funding systems. Apart from public transport sometimes being viewed apprehensively as unfamiliar territory, especially if you have to sit next to a stranger, long-distance passenger rail’s ‘invisibility’ is re-inforced by the relative allocation of public resources. If our land transport programmes focus on easing road congestion, while rail service speed, frequency and quality decline, then no wonder people don’t bother thinking of, let alone using, the train. We suspect – and hope we have shown in this paper – that if we stand back and look logically, international good practice suggests that serious funding for long-distance passenger rail actually pays out very well in terms of public benefit.

4. “Rail’s potential? – you can’t be serious!”

Long-distance rail’s potential advantages over road and flying include comfort, reliability, safety and environmental impact. If stated preference techniques were used, these benefits could be captured to establish the values placed by people on having a rail service available for occasional use, or use by others.

Long-distance passenger rail’s potential markets include:

- Inter-regional travel for business, social and leisure purposes.
- Longer-distance commuter use, or ‘outer-urban’/ regional services linking into the larger centres.
- A scenic tourism ‘rail experience’, surpassing other ways of seeing New Zealand in comfort and amenity, bringing in overseas currency and positively marketing New Zealand overseas (today’s tourists may be tomorrow’s migrants; today’s backpackers may be tomorrow’s overseas business leaders).
- Access to smaller centres, rural regions, and remote urban areas (with social inclusion and economic development benefits)
- Alternative access when incidents and emergencies affect other transport modes.

There is evidence that people are willing to pay more to travel by rail rather than long-distance bus or coach (and that the markets served are different).

Safety and environmental comparisons give rail an advantage over road, and these relative advantages increase as usage and loads increase.

Long-distance rail travel times are not currently competitive with road. However, 40 years ago the record Auckland-Wellington trip time was 8 hours 40 minutes – comparable with current times by road. Today the scheduled time is 12 hours. Conventional (not ‘high-speed’) rail services on the similar-distance London-Glasgow or London-Edinburgh trip take 4 to 5 hours.

Significant increases in long-distance passenger rail’s mode share are sometimes said to be non-feasible on the basis of past trends. However, rail’s historic mode share was much higher than today, and would be higher than at present if investment had kept pace with roading improvements over rail’s decline period. Reduced demand for long-distance rail services is a logical and predictable response to reductions in service levels, convenience, availability and – most crucially – the pricing of alternative modes. If these factors were reversed, international evidence suggests that demand for long-distance rail services would grow back again. For example, current initiatives in the UK are aimed at improving and expanding rail networks.

Inter-urban trips form a high proportion of the total current New Zealand trip ‘market’. In some cases, existing long-distance and outer-urban patronage could be grown through higher frequencies/ capacities, faster travel, greater comfort, better facilities and lower costs, which would make rail an attractive choice compared with private car driving.

There is also potential benefit through rail services being integrated with other visitor and tourist centres and attractions.

Greater long-distance passenger rail use could yield macro-environmental benefits such as in the carbon neutrality area (an increasing concern of individual businesses and governments), emission targets, and resilience in relation to substantial oil price rises.

Passenger rail (whether long-distance or otherwise) can also reinforce urban form objectives such as mixed-use nodal centres, transit-oriented development, higher urban densities, and integration with local walking and cycling networks focused on rail stations. Within urban areas, rail is often perceived more positively in 'social class' terms than is bus, as well as having comfort advantages, thus increasing its potential to attract users from private cars.

5. Assessment and evaluation – a two-stage process is important

Without a rational basis for investment and co-ordination across a programme as a whole, individual activities (and even 'packages') within a programme may fail to work towards strategic objectives.

Multi-modal and integrated strategic assessment needs to be undertaken before any detailed evaluation of particular services. No matter how good detailed evaluation is, there will always be matters not covered – such as potential interaction between individual proposals, and also the cumulative effect of individual proposals on wider outcomes.

International practice suggests a two-stage process is needed:

- Firstly, **strategic assessment**: taking account of a broad range of objectives, to determine the broad balance between different elements of a total programme,
- Following on from this, **detailed evaluation**: narrower pre-investment scrutiny of individual proposals

Economic and fiscal aspects are important for both stages.

Strategic assessment needs to be multi-objective, supported by a value-for-money assessment, for example through an outline cost-benefit analysis of alternative strategic options.

Detailed evaluation needs to take into account all relevant factors, including standard cost-benefit analysis and financial analysis.

Assessment and evaluation processes should inform investment decisions and assist operational planning. Methods and procedures need to be of a high standard to make the most of existing assets and to obtain good value for money. Without good assessment and evaluation processes investment is likely to be wasteful and ineffective.

6. What happens internationally – strategic assessment

Rail needs to be fully integrated with other transport planning, rather than being regarded as a 'special commercial case'. Decision-making on rail proposals needs to form a full part of broader transport planning procedures and timeframes. This applies whether rail is in public or private ownership.

Information, modelling and assessment techniques for rail are needed, just as much as they are for road. Without quantified information being made available, there cannot be any adequate comparison between road and other modes.

Strategic assessment would enable the rail system to be considered as a network – in the same way as are State highways. Without strategic rail network assessment, detailed route or corridor planning may be piecemeal and based on relatively narrow objectives (e.g. to increase rail freight on particular corridors by a given amount).

Strategic assessment needs to describe conditions, identify issues, test future strategic options, and select a preferred future direction.

Assessment framework methods, such as strategic environmental assessment, could be used at a nationwide and inter-regional scale. Supporting strategic methods could assess social, health and economic impacts.

Quantified supporting techniques may require some form of descriptive and predictive model, based on a representation of the transport system, and responsive to changes in economic and social conditions. Strategic options should align with national objectives, and be responsive to issues identified in the assessment.

Examples of this in practice include the 2006 Australian *National Guidelines for Transport System Management in Australia*, and the UK's 2007 *Delivering a Sustainable Railway White Paper, Summary of Key Research and Analysis, and Rail Technical Strategy*.

7. What happens internationally – detailed evaluation

Detailed evaluation should be informed and guided by the strategic assessment, which should confirm the required nature and scale of future actions.

There are costs and benefits associated with rail, over and above its actual use, although not all of these can be satisfactorily monetised at present. Detailed evaluation therefore needs a range of techniques, not only cost-benefit analysis, so as to consider all relevant matters, including externalities.

Typically relevant factors include capital and operating costs; time savings; comfort; reduced operating costs of other modes; safety; environmental costs of other modes; option values; wider economic benefits; accessibility; social inclusion; and congestion relief.

Investment in rail should only be made if there is a reasonable cost-benefit ratio, or compensatory non-monetised benefits. Virtually all countries use a standard cost-benefit analysis type evaluation, covering those elements which can easily be quantified using standard techniques. For example:

- A 'standard' cost-benefit evaluation could include capital costs (vehicles, technology, construction) and ongoing maintenance, operational costs and administrative costs.
- Benefits and disbenefits are usually measured by changes to non-user operating costs; non-user time costs; and safety.
- Techniques include evaluation periods varying between 25 and 75 years; discount rates between 2 and 10%; and the use of willingness to pay, the 'rule of a half' and consumer surplus theory.

Cost-benefit analysis, the interface between transport planning and transport economics, can now include more monetised attributes than in the past. Some countries give monetised values to user charges and revenues; disruption during construction; noise; air pollution; emissions; and socio-economic impacts. Despite a range of values used, there is a general international consensus about what should, and should not, be included in economic appraisal.

Option values, indirect use values and non-use values, all of which originated in environmental economics, have relatively recently been transferred to transport economics. Option and non-use values are particularly important in evaluation of lightly-used 'social' rail services serving remote areas, as these values form a larger proportion of total economic value than for urban services.

'Intangibles' include tourism benefits, and these may not be captured by conventional economic appraisal methods. Current UK work seeks to identify wider economic benefits, including agglomeration effects. Even though tourism could potentially divert benefit from alternative areas, there is still a net national benefit if it diverts tourists to areas where incomes are low, or unemployment is high. Also, in New Zealand's case, where tourists from overseas are a high proportion of the whole, rail investment may also serve to increase the total quantum of overseas visitors, and thus imported wealth.

Examples of international best practice in detailed evaluation include the 2007 UK *Guidance on Rail Appraisal*; the 2004 Scottish *The Case for Rail in the Highlands and Islands* study; and the 2006 US/ Canada *Alaska Canada Rail Link Phase 1 Feasibility Study*.

8. What happens in New Zealand – Strategic Assessment

Strategic assessment is not undertaken in any comprehensive sense in New Zealand. The Explanatory Note to the 2008 *Land Transport Management Amendment Bill* states “*There is a strategic gap between the vision and broad objectives in the NZ Transport Strategy, and their implementation*”.

Except for a very brief and short-lived 1999 *National Transport Statement*, the first explicit government strategy on transport was the 2002 *NZ Transport Strategy*, the vision and objectives from which were enshrined in legislation via the 2003 *Land Transport Management Act*.

These are not easily translated into operational decision-making on funding allocation. Attempts have been made through the former Land Transport NZ’s *Allocation Process*. This year, the *Updating the NZ Transport Strategy* document places targets against performance indicators. However, it remains elusive how terms like “*affordable, integrated, safe, responsive and sustainable*”, or “*assisting economic development*”, “*assisting safety and personal security*”, “*improving access and mobility*”, “*protecting and promoting public health*” and “*ensuring environmental sustainability*”, find expression in numerate-based decisions on individual activities.

The 2005 *National Rail Strategy* (which followed on from the 2002 *NZ Transport Strategy*) states that “*Long-distance passenger rail services presently receive no central or local government subsidy*”, although without any rationale statement supporting it. Two months earlier, the *NZ Surface Transport Costs and Charges Study* had stated that, for long-distance rail travel, “*charges (fares) should be significantly reduced to better align with marginal costs*”.

Neither the 2002 *NZ Transport Strategy*, 2005 *National Rail Strategy* nor 2007 *National State Highway Strategy* uses systematic multi-modal strategic analysis techniques. This is partly because suitable data capture, techniques and models have not been developed at the inter-regional or national scale.

The ability of individual modal interests to negotiate financial arrangements primarily with the Treasury, rather than central transport ministries, agencies and authorities, is an issue in NZ. General transport planners within these agencies may not have good public transport (especially rail passenger) experience, and rail operators may also have a shortage of general transport planners with a broad understanding of the transport system. These factors, together with the strength of the road sector lobby, may lead to an institutional bias.

ONTRACK has developed a national rail network plan, but to date this has been treated as confidential and has not been made widely available within the transport sector.

The regional land transport strategies of Auckland, Canterbury and Wellington have each identified some inter-regional issues, but none of these addresses long-distance passenger or freight rail in any comprehensive sense.

At the sub-regional or urban scale, the underlying modelling used to support the several assessment-based initiatives tends to be of limited use in testing future scenarios, particularly on pricing. This limits their usefulness for public transport purposes. These models produce relatively fixed demand matrices, and their elasticity limitations render them unresponsive to price changes.

The former Land Transport NZ has adopted regional and local-level strategy evaluation procedures, and has used these to inform funding decisions on detailed proposals. However, the spatial area covered by current strategies renders them unable to cover the development potential of long-distance passenger or freight rail services.

The 'strategic' value of projects (mainly security of access or investment option) may be identified if not captured elsewhere, but the method of doing this is unclear, it is mainly applied to roads, and it is used in detailed evaluation rather than strategic-level studies.

In short, strategic assessment in New Zealand is extremely limited, and what does exist mitigates against capturing the value of long-distance passenger rail.

9. What happens in New Zealand – detailed evaluation

No standard evaluation proposals exist in New Zealand to be applied to all transport proposals. Each organisation has developed its own procedures for practical purposes, although neither ONTRACK's nor Treasury's are published, nor are widely available within the transport sector.

ONTRACK undertakes route, corridor and network costing studies, but these are not published. These are very important, but inadequately substitute for full network assessment and planning.

The rail sector tends to be commercially sensitive, and therefore secretive in publication of data. It may also be defensive because current assessment and evaluation tends to favour road-based modes. There is no information on overall policy, assessment, evaluation, strategy or programming, and virtually no project information. The rail sector tends not to have access to public resources for modelling and analysis. Even if a public sector planner wanted to better understand the rail industry, it would be very difficult to do so. By contrast, the roading sector is publicly funded, and relatively open to making data and analysis freely available; maybe this is because the assessment, evaluation and funding systems were originally created to support motorised road transport.

The National Land Transport Fund was originally set up as a National 'Roothing' Fund, supported by hypothecated funding from petrol taxes and (freight) road user charges. Ever since this time, there has been a public impression that this fund 'belongs to those who pay' those taxes. Although since 2002 this philosophy has weakened, public transport projects could originally only get funding on the basis of benefits to those paying road-related taxes or charges – as implied by the title of the *Alternatives to Roothing* funding category. Since this time the National Land Transport Fund has been broadened to cover urban public transport, but again this is where benefits to motorists (through mitigated congestion) apply. Long-distance passenger rail, throughout this period, has remained tantalisingly off the radar of what in theory has become a holistic 'land transport' funding system. Part of the reason may be that many of long distance rail's benefits accrue to the nation as a whole, rather than to motorists (e.g. mitigated congestion is rarely a benefit of long-distance rail). To this day, about 80-90% of the National Land Transport Fund is spent on roading.

There are two exceptions to the limited detailed evaluation of NZ rail proposals:

- the 2001 *Southerner Rail Passenger Service Viability Study* dismissed externalities as insignificant, and did not undertake full cost-benefit analysis; this, even though the report's limited economic analysis showed the cost of losing the service was comparable with the regional economic benefit of retaining it. The *Southerner* Christchurch-Dunedin-Invercargill service closed the following year.
- The 2006 *Hamilton-Auckland Rail Service Feasibility Study* found the service not to be commercially viable in purely financial terms, even though there was an economic case on a standard cost-benefit basis. The service had closed five years previously, and was not reinstated.

The NZ Transport Agency's (former Land Transport NZ's) comprehensive evaluation procedures for individual proposals and packages is supported by highly-developed procedures for the economic evaluation of multi-modal proposals. Although the Agency's *Economic Evaluation Manual* is in continuous development, supported by directed research, rail evaluation procedures are only applied to urban systems in Auckland and Wellington.

NZ evaluation rules are generally permissive rather than prescriptive. In practice economic appraisal is dominated by user travel time values, vehicle operating costs and safety cost savings. Valuation of environmental effects, travel choice, public health effects and wider economic and social effects tend to be downplayed, and (with the exception of mitigation costs) are irrelevant to decision-making.

It is currently possible to use cost-benefit analysis to identify 'high-performing' proposals diametrically opposed to the targets or outcomes required by higher-level policies or strategies.

Rail project evaluation is required to use 'willingness to pay' and 'consumer surplus' techniques. 'Willingness to pay' will always be low if the service provided starts out as poor compared to its competitors.

Detailed rail evaluation in NZ also suffers from information shortages, sub-optimal allocation of costs through charges and pricing, difficulties over allocating privately-accruing benefits and costs, and inconsistent treatment of profits. It is therefore hardly surprising that rail services are termed 'unviable' or 'uneconomic'.

10. What needs to happen now

Current NZ methodologies fail to capture rail's wider societal benefits. To do this, pricing should be based on marginal social cost (i.e. taking into account historic under-investment), externalities and marginal delay costs. 'Business as usual' or 'financial recovery' approaches will not result in an outcome serving the *NZ Transport Strategy's* vision and objectives. A co-ordinated evaluation methodology is needed, in place of the current isolated and conflicting individual institutional procedures, which skew decision-making away from already-stated strategic objectives.

The 2005 *Surface Transport Costs and Charges Study* suggested a pricing regime that encourages 'wanted' and discouraged 'unwanted' behaviour. It also showed that subsidy for long-distance rail is warranted.

Although the 2005 study has been criticised by those advocating higher levels of road investment, it remains broadly valid, is consistent with a similar study undertaken in the UK, and there is little credible alternative analysis to set against it.

The 2006 UK *Eddington Transport Study* also suggests that assessment and evaluation should be set against the background assumption that such an optimal pricing regime is in place in the future.

Once this analytical framework is defined, options and alternatives need to be developed, and tested using the processes set up (regardless of whether railways are in private or public ownership).

The Land Transport Management Act requires early and full consideration of options and alternatives. This should include examining possible roles of rail at national and regional scales, and integration of rail proposals with other modes, including road-based public transport. The effects of a well-developed national rail network on national economic, environmental and safety performance all need to be taken into account.

Improved passenger rail services should not be considered in isolation. At the very least their synergies with improved freight facilities need to be considered, to establish the best overall value for money, and the best outcomes for inter-urban corridors. Where routes are mainly for freight, it is

logical for passenger services to be only charged marginal costs. Beyond this, comparisons are needed between rail proposals and other options to provide the same capacity via other modes; for example, where roads are set at capacity, improvements in rail capacity, speed, frequency and comfort may be possible without requiring new land.

Assessment methodology needs to take into account the public's 'willingness to pay'. The costs of not investing in the rail network, including asset loss in the case of closures and 'mothballing', needs to be included.

Rail may be able to achieve some things road can't, such as servicing urban centres, maximising use of certain corridors, providing reliable peak period travel times, or providing a particular positive type of journey experience. These need to be taken into account.

Appropriate data gathering, analysis and modelling are needed to identify issues, quantify needs, test options and forecast effects. Current transport planning is primarily focused on road networks, and conventional transport modelling is often of limited usefulness in evaluating rail proposals. This is because of the underlying structure of conventional transport models; inadequate allowance for induced traffic; and a general problem with large multi-modal models in dealing with 'minority modes'. Standard demand-based models tend to ignore reliability, crowding and interchange issues, which are all important for rail.

Determinants of rail demand are available from econometric studies of actual experience, and from stated-preference-based market research brought together in the 2007 UK *Passenger Demand Forecasting Handbook*.

Road and rail cannot be equitably compared unless the pricing regime is based on marginal social cost. This particularly the case in NZ where standard cost-benefit analysis is still applied in practice to establish absolute 'value for money thresholds' for investment.

For a true comparison, the role each transport mode plays within an overall transport (and land use/ resource management) system needs to be explicitly recognised. If not, rail proposals may continue to 'consistently' fail assessment and evaluation tests, as 'uncompetitive' with road transport, rather than for their own value.

Strategic assessment and detailed evaluation needs to be co-ordinated across the whole transport sector, and be 'mode-neutral'. Properly integrated with each other, these should ensure that investments and operational planning are more likely to generate good outcomes

11. Conclusion: Imagine the Future

During our research we undertook other work, to envisage how our **main paper (available on the Victoria Transport Policy Institute's website, www.vtpi.org)** might be applied. One of these was an outline network of a possible New Zealand nationwide passenger rail system.

Imagine picking up something looking like an urban metro services map, but spanning lines from the Bay of Islands to Invercargill, from New Plymouth to Hawkes Bay. Imagine internet-booking the nine-hour Wellington to Auckland journey, and clicking on radio-button options like "*via National Park*" or "*via New Plymouth*", "*night*" or "*day*", and for the night service "*couchette*" or "*reclining seat*".

Imagine if from Roger's home town of Carterton, he could catch the smart new rolling stock (which is already running) in the other direction to Hastings, Napier and Gisborne. Or if someone booking the whole Wellington-Hawkes Bay journey could click on choices "*via Palmerston North*" or "*via Masterton*".

Imagine business people waking up refreshed, washing, and tucking into a good cooked breakfast as Pukekohe rolls by, putting away their napkin as Britomart approaches, before the taxi to their business meeting. Beats 6.30 a.m. airport check-ins, or being delayed in Auckland morning traffic congestion. Or, for Pukekohe read Otaki, for Britomart read Wellington.

Imagine the Greater Christchurch commuter, living in Banks Peninsula's Diamond Harbour settlement (by then expanded in line with the Greater Christchurch Urban Growth Strategy) catching the ferry to Lyttelton, stepping straight off it and onto the suburban train at Harbourside Station, and stepping off 10 minutes later at the Colombo Street Interchange with the CBD light rail system.

And then overseas people, having had an earful of Billy Connolly's rough-hewn excitement, could book their combined package, travelling the length and breadth of New Zealand by rail, checking into pre-booked accommodation at each stop, and customising their own preferred combination of local visits, ski-ing, tramping, whale-watching, mountain-biking or whatever, from the comfort of their computer in the Cotswolds, without being bemused to discover that the rail service they'd seen enthusiastically extolled by the effing-and-blinding entertainer was fully-booked, infrequent, or actually scrapped, because someone in a Wellington office had not considered that particular leg to give an acceptable first-year rate-of-return.

Maybe the public benefits of this sort of thing aren't imaginary after all.

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