Colin Crampton

> Our wealth did not create our transport infrastructure; it is our transport infrastructure which created our wealth.
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> John F Kennedy

A Culture of Lead INFRASTRUCTURE

Introduction

In a time of global economic downturn, such as the one we are living through, it is important to ensure that we do everything we can to make ourselves as competitive as we can in the global market. The government's priority for transport is to invest in land transport to increase economic productivity and growth in New Zealand. Quality land transport infrastructure and services are recognised as being an essential part of a successful and resilient economy. Good quality land transport enables people to access employment and businesses to get their goods to markets across the country, and is the first link in the 'logistics chain' to international markets, through our ports and airports. Therefore, investing in quality infrastructure, as John F. Kennedy so eloquently put it, contributes to our economic growth and productivity.

Colin Crampton is the Group Manager Highways and Network Operations with the New Zealand Transport Agency (NZTA). He is responsible for New Zealand's state highway network of 11,000 km, with an annual expenditure of $1.6 billion and replacement costs of $29 billion.

Ensuring we get quality infrastructure through investing in land transport is the responsibility of the New Zealand Transport Agency (NZTA). The NZTA takes a lead in planning the land transport network; investing in land transport; managing the state highway network; and providing access to, and use of, the land transport system through the licensing of vehicles and people. The aim of this article is to outline:

- how the NZTA contributes to economic growth and productivity gains;
- how the NZTA invests in infrastructure; and
- what cultural changes the NZTA has needed to initiate to address these issues.

It is not the purpose of the article to make the economic case to invest in public infrastructure and establish that long-term benefits accrue. There were sufficient papers presented to the Motu–IPS conference that already demonstrate this relationship. However, this article shows how in practice the NZTA approaches the task of ensuring that

New Zealand has a land transport system that is fit for the purpose and supports a resilient economy that competes in global markets.

The NZTA enables productivity improvements and economic growth by being involved in integrated planning to ensure that land use and transport links are planned together. In doing so the synergies that exist between having a quality planning framework and a well-managed land transport system can be captured. The NZTA also enables productivity improvements and economic growth by being responsible for improving the efficient and safe movement of people and goods around the state highway network and ensuring improvements in effectiveness of the transport system using the concept of 'levels of service' in terms of a performance measure.

The NZTA places particular focus on the Auckland network; critical routes between population centres; and routes carrying significant volumes of freight and large numbers of tourists. It recognises the importance of these routes to the overall economic well-being of the country. The NZTA sees itself as a service provider of quality links for our export market. All the high-performing industries, such as forestry, dairying and tourism, need a quality transport system to achieve, and maintain, their potential.

In fulfilling its role in planning and investing in the land transport sector the NZTA gives effect to a number of key documents:

- long-term transport sector outcomes, both national and regional;
- the National Infrastructure Plan;
- *Safer Journeys: New Zealand's road safety strategy 2010–2020; and*
- *Government Policy Statement on Land Transport Funding (GPS).*

The government policy statement on land transport funding sets the government's priority for land transport investment to support national economic growth and productivity. The GPS covers the impacts the government wishes to achieve from its investment in land transport, how it will achieve these impacts through funding certain activity classes, how much funding will be provided, and how this funding will be raised. The government directs investment through the activity classes (such as the activity class for new and improved state highways) into high-quality infrastructure projects and transport services that encourage the efficient movement of freight and people. Of particular importance are:

- investing in the state highway network as a key to the efficient movement of freight and people; and
- generating better value for money from government's investment across all land transport activity classes and enhancing economic efficiency of individual projects.

In the short-to-medium term the impacts the government wants to see are improvements in the provision of infrastructure and services that enhance transport efficiency and lower the cost of transport. To achieve this, the government wants improvements in journey-time reliability; easing of severe congestion; more efficient freight supply chains; and better use of existing transport capacity. This will provide better access to markets, employment and areas that contribute to economic growth, thus ensuring a secure, resilient transport network. Other impacts sought are reductions in the number of deaths and serious injuries on our road network; provision of more transport choices, particularly for those with limited access to a car; and reductions in the adverse impact on the environment and contribution to positive health outcomes.

As an example of how this works, the rest of this article uses the state highway network as a case study to show how these government priorities and impacts are given effect to when managing and investing in the state highway network. The NZTA tackles this in three parts:

1 What is the function of the highway network?
2 What level of service do we aspire to?
3 How best to allocate resources?

1. The function of the state highway network

In November 2010 the NZTA proposes to engage with stakeholders on a state highway classification system. The proposed classification system is built up around the function of the road. The classification system would balance the functional requirements of different state highways and would recognise:

- routes connecting major centres and thus having significant traffic volumes;
- port and airport connections;
- routes carrying a high proportion of freight;
- routes with high tourism volumes; and
- essential lifelines.

To put this into context, set out below is a range of examples.

State Highway 1 (SH1) is the spine of our state highway network. It connects Cape Reinga to Bluff, so its function changes.

SH1: Auckland to Hamilton

State Highway 1 (SH1) is the spine of our state highway network. It connects Cape Reinga to Bluff, so its function changes. The section south of the isthmus of Auckland down to Hamilton is a strategic section of SH1. It links New Zealand's largest city with the rest of the North Island and on to the South Island. It also forms one side of what has become known as the 'Golden Triangle', between Auckland, Hamilton and Tauranga. It is a section of SH1 that contributes very much to New Zealand's economy. This section of SH1 carries around 20,000 vehicles a day, of which 3,000 vehicles are trucks. Its function is very much one of moving people and freight, so it is a key link for business.

High tourism volumes: Queenstown to Milford

In contrast, the route between Queenstown and Milford may carry only a few thousand vehicles a day, yet it provides access to one of New Zealand's most iconic locations for over 100,000 tourists each year. As such, it makes a major contribution to tourism in New Zealand. Thus, this function of access for tourists to New Zealand's iconic locations needs to be recognised when managing the route.

Essential lifeline

At the other end of the functional scale, State Highway 73 provides a key link between Christchurch and the West Coast. The alternative is very long, and as such SH73 forms a lifeline between the west and east coasts of the South Island. The link provides connectivity between the two communities and allows the economic interaction that is so essential to the smaller communities on the West Coast.

In operating, maintaining and improving the state highway network it is necessary to have suitable systems that can respond to the differences between state highways. One way of managing this is to use a classification system as a way to predetermine the effectiveness of the transport network through specifying levels of service targets.

2. Levels of service

To measure and monitor the effectiveness of the state highway the NZTA uses three factors to determine the outcomes. These are reliability, safety and environmental responsibility. These factors relate back to the government's 'impacts' of improving journey-time reliability, reducing deaths and serious injury and reducing adverse impacts on the environment. To assist us with setting the appropriate level of service we are engaging with our customers and stakeholders to hear what their views are on these three areas.

Reliability

A reliable network is one where drivers can travel at their desired travel speed within the posted speed limit. This would be translated into a reliable Auckland network through not only completing the Western Ring Route, but also ensuring that there is the right balance between transport modes given the demand to travel. However, the future focus will be on getting the best out of the existing network through informing travellers before they travel, ensuring timely information is available during the journey, and ensuring that intelligent transport systems (such as ramp metering and variable message signing) are introduced effectively to ensure that the optimum use is made of the network and that travel times are reliable no matter what time of day you travel.

The challenge is how to allocate priority to all projects between today and our aspirational priorities for tomorrow.

Safety

Secondly, safe travel will be promoted through targeting maintenance and improvements to the network that contribute to a '4-star KiwiRap rating' on the heavily trafficked parts of the network. Star rating a road is a proactive approach to road safety. It enables sections of road with a relatively high level of risk to be identified before a crash occurs. The star ratings will make drivers aware of the relative safety of the roads they use, as well as help identify roads that will benefit from safety improvements.

Environmental responsibility

Thirdly, adopting environmental and social norms through appropriate standards in air, noise, water, community separation and good urban design will ensure that we meet the government's aim of a reduction in adverse environmental effects of land transport.

By combining function and levels of service we can compare what we have today with what our aspirations are for the network as a whole in the future. This generates the gap for improvements we need to close over the longer term.

3. Allocating resources

Investing in land transport is a closed system in the sense that all revenue collected from fuel, road user charges and licences is directed back into transport. Other funding sources for transport are the local government rates contributions for local government transport operations and improvements (including public transport). The ring-fencing of transport-related taxation is a policy a lot of countries would love to see implemented in their own jurisdiction. It means that in New Zealand all the tax revenue collected from road user charges, vehicle licensing fees and tolls is returned to the national land transport fund to support future investment in transport.

It is the role of the government policy statement on land transport funding to set the level of revenue against the outcomes for transport. Our job is to contribute to this debate with information: for example, on the roads of national significance. There is an economic argument for completing them sooner, so do we want to put more revenue into these routes? This has meant there has been a need for a culture change around how transport improvements are considered within the wider picture of economic growth and productivity.

The challenge is how to allocate priority to all projects between today and our aspirational priorities for tomorrow. One tool the NZTA uses to assist with this is to profile projects for the purposes of assessment using the three factors of strategic fit, effectiveness and efficiency. Each of these three factors is given a rating of H: high, M: medium or L: low. Therefore, an assessment profile of HMM means the activity was rated high for strategic fit, medium for effectiveness and medium for economic efficiency. This provides for a multidimensional assessment and ensures that the strategy for a route improvement or for an urban

area is given weight when investing in transport infrastructure.

The assessment factors are defined as follows:

Strategic fit

- links to key government aims;
- key freight and tourist routes;
- key functions such as access to jobs and business;
- congestion relief.

For example, the Wellington Northern Corridor (Levin to Wellington Airport) is classified as high strategic fit because it aims to improve access to the Wellington CBD, key industrial and employment centres, the port and airport. It provides relief from severe congestion both within the Wellington CBD and at Otaki, as well as improving the journey-time reliability and safety between Levin and Wellington Airport.

- Effectiveness
- supports national network;
- multi-modal;
- integrated with land use.

For example, Tauranga Eastern Link will reduce the cost of travel to Tauranga Port on a very busy route at the same time as providing improved environmental outcomes for Te Puke. It also supports the growth along the Papamoa peninsula in line with the SmartGrowth strategy for the Eastern Corridor by providing a good quality road network and opportunities for public transport and active modes, thus supporting the 'live work play' strategy adopted within the SmartGrowth area. This strategy encourages diverse land use patterns for an area, such as business parks being located within easy reach of residential areas and community facilities.

Efficiency

Efficiency is measured by the ratio between the cost of a project and the benefits generated (benefit-cost ratio or BCR). We place a particular focus on analysing the benefits on the basis of a route not just a project. By doing this we ensure that the whole strategy and package of improvements for a route are evaluated and optimised. The NZTA also recognises that there are wider benefits generated by a project. These wider benefits include agglomeration benefits, such as competitive advantage generated by improved access to markets, as well as employment advantages of improved access resulting in more and higher-value jobs.

For example, the completed Waikato Expressway will provide a four-lane divided carriageway between the Bombay Hills south of Auckland and Cambridge. It is expected to deliver several significant benefits which include reducing the journey time between Waikato and Auckland at the same time as providing better journey-time reliability and a safer route. The Expressway will bring, through the enhanced connectivity between Waikato and Auckland, the encouragement of economic development opportunities. It will improve supply-chain routes and industrial growth, as well as improve access to Hamilton International Airport and the major ports in Tauranga and Auckland.

Another example is the package of improvements to complete the Auckland Western Ring Route, which generates journey-time savings for travellers. It provides improved access to employment for a wider area: this converts to roughly $80–$100 million per annum of wider economic benefits from the package of improvements.

The standard BCR as currently calculated is based on an 8% discount rate. Some would argue that this discount rate leads to investment that is too focused on short-term projects at the expense of large, long-term infrastructure. The NZTA's process allows for sensitivity analysis of the BCR using discount rates of 6% and 4%. The effect of lowering the discount rate is to increase the numeric value of the BCR, reflecting the long-term nature of the investment.

Prioritised and then programmed

Prioritisation is placing projects in order in terms of their merits, based on the three-factor assessment profile. So, the project, package or combination of projects that is assessed as having a profile of high strategic fit, high effectiveness and high economic efficiency (BCR above 4) would be placed at the top of the priority list and those projects with a low strategic fit, low effectiveness and low economic efficiency (BCR below 2) would be at the bottom of the list.

The programming of the delivery of the investment is not a simple task. In an ideal world, investment would be undertaken in priority order from the top of the prioritised list down. In reality a more pragmatic approach has to be taken, to balance the competing demands of cashflow management, resource levelling, stimulus aspirations, and the ever-present project development and delivery risks that impact on both cost and timelines of delivering the overall portfolio of projects. This is particularly true when the portfolio of projects contains a mix of small, medium, large and extremely large projects at different stages in their project life cycle. Therefore, the programming over a ten-year period has to be determined by best value for money, and the optimal use of resources.

State highway improvements, maintenance and operations are considered in the context of the whole national land transport programme and so they are seen in the context of the whole land transport network. In conclusion, this has meant a culture change for the NZTA. This change can be summarised by five points:

1) Contributing to the government policy statement discussions by outlining the outcomes that are possible from current and projected revenue streams, and demonstrating to New Zealand the best use of the land transport dollar for state highways and other transport improvements.
2) Using more than the standard benefit-cost-ratio to prioritise projects. That means looking at the corridor as a whole and looking at wider economic benefits.
3) Understanding the need to provide an appropriate level of service on the different types of state highway, and the need to provide economic stimulus.
4) Protecting the network to maintain the levels of service.
5) Operating the network to take greater account of the function of each state highway.