

# **NZ Transport Challenges – Two Think Pieces**

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### **Abstract**

This technical note summarises two "think-pieces" commissioned by the former Land Transport NZ (now the New Zealand Transport Agency) in 2008.

The first is a research paper by McCormick Rankin Cagney that forecasts future oil prices, estimates consequential impacts on travel demand, and identifies "no regrets" interventions that central and local government could implement to reduce the transport system's dependency on oil based transport fuels. Oil prices are a significant cost of running vehicles, constructing and maintaining roads, and providing passenger transport services. Decision makers in central government and local government need to manage demand for transport in less energy intensive and more sustainable ways to mitigate the potential impacts of changes in oil prices, and ensure the best decisions are made to meet medium and long-term transport needs.

The second is a think-piece by ViaStrada Ltd that considers practical ways to get the most out of New Zealand's road transport system. The report profiles five international case studies and 30 New Zealand examples, and identifies interventions that local authorities can consider to manage competing demands for scarce road space (to move cars, people and freight safely, efficiently and sustainably). The discussion document calls for leadership within the transportation and land use professions and by elected officials locally and regionally to make the changes needed to implement the NZ Transport Strategy.

### **Disclaimer**

This technical note and the original research reports do not represent the views of the NZ Transport Agency. The material contained in this note and the reports are the analysis of the independent report writers and their teams. The work should not be construed as policy of the NZ Transport Agency but it may be used in the formulation of future policy.

## Introduction

The recently published New Zealand Transport Strategy 2008 (NZTS) and the first Government Policy Statement (GPS) on land transport funding identify a number of serious challenges facing the land transport sector, including CO<sub>2</sub> emissions, traffic congestion, the road toll and rising fuel prices. The NZTS says the challenge we face is to improve the way we travel, so we cause as little damage as possible to the environment and minimise harmful effects on others. The former Land Transport NZ (now the NZ Transport Agency) commissioned two pieces of analysis to contribute to ongoing discussions with local government partners about improving transport outcomes.

Both “think-pieces” provide information for local authorities about the importance of an integrated approach to transport planning generally, and in particular the benefits of encouraging greater mode shares for walking, cycling, public transport, and other low energy transport options for their local communities. Both papers identify drivers for, and necessary changes in, consumer demands, and identify practical responses that could be implemented by local authorities.

The research paper: *Managing transport challenges when oil prices rise* (McCormick Rankin Cagney) considered future oil prices, consequential impacts on travel demand, and implications for government agencies. Oil prices play a major role in the costs of using a motor vehicle, constructing roads, maintaining road surfaces, and running passenger transport services. In these circumstances, it is important for planners in central and local government to understand potential impacts of changes in oil prices, so the best decisions can be made to meet medium and long-term transport needs.

The think piece report: *Transport Network Optimisation* (ViaStrada Ltd) considered practical ways to manage competing demands for scarce road space and make the most of existing road asset infrastructure. Achieving transport policy outcomes will require local authorities to implement smarter ways of managing land use (to manage the need for travel) and encouraging more sustainable modes of transport (such as walking, cycling and public transport) and to avoid attempting to build our way out of traffic congestion across roading networks.

## Managing Transport Challenges when Oil Prices Rise

The research paper, published in August 2008, describes briefly the conditions that have led to recent rises in oil prices. Future oil prices were modelled using a Monte Carlo simulation that combined a number of price forecasts to generate a statistically representative distribution of future oil prices. The Average price, along with associated Upper and Lower confidence intervals, were extracted from this distribution. The Average price projection indicated a drop in oil prices may be expected in the second half of 2008 after which prices are expected to escalate to reach approximately \$155 per barrel (2008 US Dollars) by 2011.

Looking ahead. prices appear to plateau and gradually drop to approximately \$125/barrel in 2028. Upper and lower price scenarios varied from \$210 to \$50/barrel respectively. Care should be taken in interpreting the long term results of the model, with a greater emphasis placed on near-term results. Future prices for transport fuels were calculated on the basis of expected movements in the New Zealand Dollar along with expected carbon and bio-fuel charges. This showed that prices for petrol and diesel may be expected to peak in 2011 at approximately \$2.80 and \$2.50/litre (2008 NZ Dollars). Risks to these price projections are expected to lie on the upside, particularly in the short term.

Travel demand elasticities were calculated with respect to fuel prices, economic growth, vehicle ownership, workforce participation, and disposable income. Elasticities for light passenger and commercial travel demands were evaluated separately. Light passenger travel demands were found to be sensitive to a variety of factors, especially fuel prices and vehicle ownership. Commercial travel demands were found to be substantially less sensitive to fuel prices and more sensitive to economic growth – the other factors considered in the analysis (that is vehicle ownership, workforce participation, and disposable income) were not found to have a significant impact on travel patterns.

Cross-elasticities for public transport and active modes were estimated using a combination of local and international studies. Under the Average fuel price scenario total vehicle kilometres travelled (VKT) is expected to remain below 2007 levels until about 2016 after which the effects of economic growth begin to dominate. There is also a shift in travel demand growth away from light passenger vehicles towards commercial vehicles and alternative modes. This is likely to require increased investment in road network maintenance and alternative transport modes.

The research report identifies a toolbox of potential solutions to facilitate the development of a more efficient transport system. Central to these responses is the understanding that travel and land use have not historically been effectively managed or priced. This has led to structural imbalances that have subsidised private motor vehicle trips. Rectifying these structural imbalances so that road users are faced with the true costs (both internal and external) of their choices is expected to deliver travel and land use patterns that are significantly more energy efficient. Recommended responses include:

- parking regulation and management; flexible zoning and urban containment; development incentives; and urban renewal and transit oriented development (TOD).
- commercial parking rate, pay parking, road pricing, and tax treatments.
- the transformation of roads into streets, investment in active modes, investment in public transport services and optimisation of existing infrastructure, multi-modal integration, and taxi services.
- travel plans, car-sharing/bike-sharing, Transport Management Associations, and public transport information.
- regional freight strategies, home delivery, and active freight.

The research analysed the effect of the recommended responses on future travel demands by estimating their expected coverage, maximum impacts, and implementation timelines. The results of this analysis indicate that the recommended responses can be expected to reduce total VKT below current levels. This suggests that land use management and direct and efficient pricing, along with targeted infrastructure, is able to preserve road network levels of service and allow for substantially increased investment in alternative transport modes.

Initial modelling indicates that alternative transport modes may account for approximately two thirds of future growth in travel demands, with the balance attributed to increasing commercial travel. Consumer savings associated with the recommended responses were evaluated in terms of averted expenditure on fuel and vehicle operating costs.

Welfare benefits were evaluated for reduced congestion, improved air quality, increased physical activity, and reduced greenhouse gases were also estimated. By 2028 the recommended responses were found to deliver total savings in the order of \$5 billion per annum (NZ Dollars) or approximately \$16 billion in net present terms. The

recommended responses are conservatively estimated to reduce reliance on oil based transport fuels by three times greater than that realised solely through improvements in fuel economy.

## Transport Network Optimisation

The transport optimisation paper, published in July 2008, is a think piece that analyses ways of optimising New Zealand's road transport network. It is assumed that we will not be attempting to build our way out of congestion. Better integration of land use and transport planning is recognised in the NZ Transport Strategy as a key requirement through to 2040 and beyond. Increasingly, New Zealand will need to get better value for money out of the road network by using existing roads better (for all modes) rather than building more roads.

The think piece paper comprises six chapters: a strategic introduction, consideration of the national context, international directions, international case studies, and a selection of New Zealand initiatives as examples of transport network optimisation.

Nationally, there is an increasing emphasis on sustainability, not just in transport but across all sectors. Fuel price rises, climate change, the health sector's support for more active lifestyles and the desire for improved urban design in our towns and cities are convincing reasons for a more sustainable transport future.

Managing land use better to minimise the need for travel will be essential. Travel demand management and other techniques to change attitudes and behaviour will be part of the toolkit for optimising our road network. This optimisation must increasingly include the needs of pedestrians, cyclists and public transport users. These changes will help us improve the quality of life in our urban areas and achieve national targets for reduced emissions, less motor vehicle travel and more travel by sustainable modes.

There is much we can do to improve the operation of the road network itself to better support sustainable travel. This includes traffic signal optimisation, implementation of traffic calming, better management of the quantity and location of parking, bus priority measures, better freight practices and enhancements to our road network to support walking and cycling. A key to better urban design and more walkable, cycle-friendly cities will be reducing traffic volumes and speeds in city centres and on residential streets.

Specific programmes for walking and cycling will be needed, not just for infrastructure, but for marketing and promotion. We need to provide conducive environments in our towns and cities where people feel they have the option to walk or cycle for routine trips to work, school, local shops and for social and recreational purposes – and then choose to do so.

Pricing and charging for roads and parking are increasingly being used overseas to encourage desired transport outcomes and these tools will be needed in New Zealand. The urge to reduce fuel taxes in times of international price rises should be resisted as pricing is a very effective way of forcing change, while at the same time helping manage congestion and raise revenue for more sustainable transport options. Ensuring users pay the full price of travel encourages people to reduce trips and choose the right mode for each trip, thus improving community outcomes.

The think piece draws inspiration from five international case studies. London (UK), Portland (Oregon, USA), Odense (Denmark), South East Queensland (Australia) and Freiburg (Germany) have been chosen to illustrate a series of measures used to manage transport in these cities. They all rely on the use of many interventions, where land use and transport planning is integrated and sustainable travel modes are actively supported.

In addition, some 30 New Zealand examples of good practice are discussed. They typically showcase an innovative solution in one of our towns or cities and are intended to provide inspiration for others to emulate. However, as in the international case studies, we will need to make many changes in our urban areas; no single treatment will be sufficient to achieve our goals.

Finally, the document includes a “shopping list” of actions for local and regional government to consider. They may not all suit every town or city, but there should be something for everyone. Strong leadership at the local and regional level, by both professionals and their elected representatives, will be needed. Change is needed now to achieve the outcomes we desire for this generation and the ones to follow.

## Conclusions

Various demographic and economic trends are fundamentally changing future transport demands. The transport system needs to be resilient: adaptable to energy impacts and to social changes, while helping respond to climate change. Significant changes in how the transport system is managed and used are also required to achieve the government’s health, climate change, energy, and transport policy outcomes.

Both reports identify potential interventions that regional and territorial authorities can consider in the short and medium terms that will lead to better transport outcomes. Oil prices are likely to continue to rise over the next few years. Rising oil prices will have a significant impact on transport costs and travel behaviours. The challenge is to manage changing transport demands and expectations while supporting economic development.

Transport growth has to be managed effectively to minimise its environmental and land use footprint, and to provide people with access by a variety of means other than private motor vehicles. There are proven interventions to manage travel demand that can decouple transport growth from economic growth, accommodate changes in the mix of transport modes, and balance competing uses of scarce road space.

Travel demand management interventions can be a no-regrets approach. The tools we need to implement are now well tried and well known: bold technical and political leadership is required to make changes. Because of New Zealand’s position at the end of the global fuel supply chain, we have the need to respond sooner than others. But our small size (and thus the relative ease with which can make change) means we are better placed than other larger countries to lead the world in sustainable transportation.

## References

Managing Transport Challenges When Oil Prices Rise, McCormick Rankin Cagney, Auckland, New Zealand August 2008

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<http://www.landtransport.govt.nz/sustainable-transport/docs/transport-network-optimisation.pdf>