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Building Our Way Out of Congestion

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Abstract

Government policy explicitly states that we will not try to build our way out of congestion. Yet Government transportation spending is at record levels, having more than doubled in the past five years and expected to continue growing significantly. The predominant share of this is for roading, much of it for new roads, and this allocation is not planned to reduce over the next decade.

A major motivation for new road construction is congestion levels and travel time variability. To any rational observer, we appear to be trying to build our way out of congestion, contrary to the rhetoric of Government policy. It seems counter-productive to be expanding our road network at a time when fuel prices are increasing at a much faster rate than traffic volumes, and fuel supply itself appears to be no longer guaranteed. The resources involved in expanding the road network could be much more wisely spent on managing traffic growth and providing alternatives to private motor vehicle travel.

This paper looks at available data to understand congestion trends relative to roading expenditure, travel time variability, and fuel price and supply. It considers ways to provide more sustainable transportation, and makes recommendations for developing a comprehensive suite of travel indicators that better represents a more sustainable transport system.

Contents

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1. Introduction

Government policy explicitly states that we will not try to build our way out of congestion: "… this Strategy recognises the increasing international experience showing that the transport sector can not endlessly build its way out of all its problems …" (NZ Govt 2002, page 12). Yet Government transportation spending is at record levels, with $24 billion now programmed under the National Land Transport Programme (NLTP) over the next 10 years (LTNZ 2006). The current annual expenditure level is $2.1 billion, up by 118% in the past five years (2002 to 2007).

The predominant share of the NLTP is for roading, much of it for new roads, and this allocation is not planned to reduce over the next decade. Currently for example, the annual ratio of new road construction and improvements (not including maintenance) to roading alternatives (public transport, walking/cycling, travel demand management) is 2.2 to 1; by 2016 the ratio will be 2.7 to 1.

Growth in roading expenditure exceeded inflation[1] by a factor of about five over the last five years. Major motivators for new road construction are congestion levels and travel time variability, particularly in Auckland and Wellington. To any rational observer, we appear to be trying to build our way out of congestion, contrary to the rhetoric of Government policy.

How bad is congestion in New Zealand's cities? How are congestion levels changing? How variable are our travel times? Do we know whether these indicators vary by travel mode? Transit New Zealand has been monitoring motor vehicle congestion levels and travel time variability twice yearly in Auckland and Wellington (since 2002), Tauranga (since 2003), and annually in Christchurch (since 2004). These surveys are starting to produce a useful time series for comparison with other relevant measures such as transport expenditure and traffic growth (Transit NZ 2006).

Our roading policies and funding practices have developed in an era of continuously increasing motor vehicle traffic volumes. However, it seems counter-productive to be expanding our road network at a time when fuel prices are increasing at a much faster rate than traffic volumes, and this trend seems set to continue well into the future. In addition to the increases in fuel costs, fuel supply itself appears to be no longer guaranteed, as India and China now consume fuel at growth rates estimated at between 6% and 8% per annum (IEA 2006). Meanwhile, while global fuel production is expected to peak in the foreseeable future under the phenomenon known as "Peak Oil". New Zealand will be even less able to ensure continuous access to motor vehicle fuel than most other countries, as the world squabbles over a resource in short supply.

To plan for New Zealand's continued social and economic prosperity would suggest a need to plan for a much smaller reliance on fossil fuels. So building more roads over the next ten years seems exactly the wrong way to go. These resources could be much more wisely spent on managing travel demand (especially by motor vehicle) and providing alternatives to private motor vehicle travel.

This paper looks at available data to understand congestion trends relative to roading expenditure, travel time variability, and fuel price and supply. It considers ways to provide more sustainable transportation. The paper argues that more emphasis should be put on travel demand management and support for walking, cycling and public transport. The paper also makes recommendations for developing a comprehensive suite of travel indicators that better represents a more sustainable transport system.

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[1] The Reserve Bank reported that inflation between 2001 and 2006 was 14.2%. www.rbnz.govt.nz/statistics/0135595.html

2. Travel Time Performance Indicators

Transit New Zealand began collecting travel time data in Auckland and Wellington in 2002, Tauranga in 2003, and Christchurch in 2004. The data are collected by using "floating car surveys" over fixed routes that attempt to represent the "principal road network" (selected motorways and arterial roads) of each city. Calculations based on the data result in estimates of congestion. The congestion indicator is measured in minutes of delay per kilometre compared with unrestrained travel at the speed limit.

The congestion indicator is valid for tracking congestion levels on main roads from year to year in each city, but can not be used for comparisons between cities, because the measure is specific to the routes chosen for each city. Travel time variability is also calculated by Transit for each of the four cities from these surveys, and this can be used to compare cities.

The latest Transit surveys were undertaken in March 2006 and reported to the Transit Board in July 2006 (Transit NZ 2006). Transit has concluded that it is invalid to compare March surveys with November surveys, because there are quite different levels of congestion at these times of year. However, comparisons between the same months from one year to another are valid. Accordingly, data used for this paper are all valid March surveys. Some early surveys were undertaken in April or May, but are included nevertheless.

In Auckland, the route for measuring congestion was changed after the first survey (March 2002) and the March 2003 survey was affected by adverse weather in the morning (AM) peak. Comparable data are now available for three years (2004 to 2006 inclusive) for Auckland, and four years (2003 to 2006) for Wellington and Tauranga. Because the survey route has changed every year in Christchurch, no comparisons can be made there. Auckland congestion levels have been fairly constant since March 2004. The data are illustrated in Figure 1:

In Wellington, congestion levels rose steadily from 2003 to 2005 but in 2006, they appear to have dropped to levels comparable with 2003. The data are illustrated in Figure 2.

In Tauranga, congestion levels generally increased between 2003 and 2005 but declined to below 2004 levels in 2006, as illustrated in Figure 3.

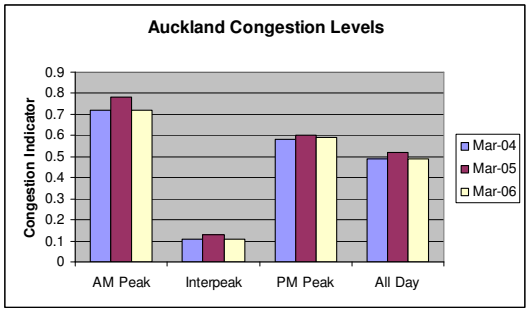

Figure 1: Congestion Indicator – Auckland

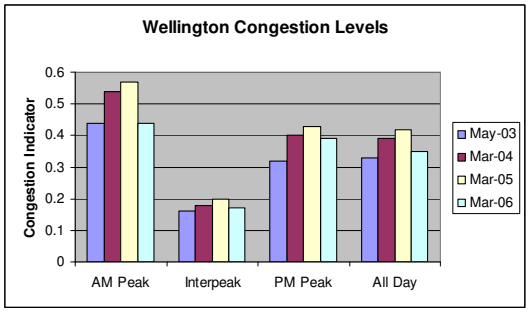

Figure 2: Congestion Indicator – Wellington

Congestion levels, as measured in Auckland, Wellington and Tauranga, have generally increased between 2003 and 2005 and declined slightly in 2006. Overall, congestion appears to have increased slightly in Wellington and Tauranga and remained constant in Auckland, but these conclusion are based on only three years data for Auckland and four for the other cities. More data are needed to fully understand the trends. The recent apparent declines in congestion might be attributable to improved road infrastructure or traffic management systems; reduced traffic levels through increased petrol prices; or mere statistical variation in traffic speeds and volumes. These surveys will become more useful as additional years of data are collected.

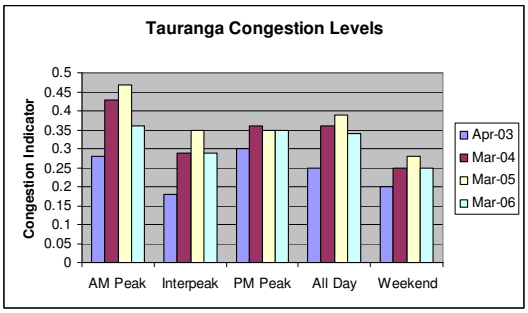

Figure 3: Congestion Indicator – Tauranga

What is already clear, however, from the congestion surveys in Auckland, Wellington, Tauranga (and Christchurch) is that there are higher levels of congestion in peak travel periods (both morning and afternoon) than in the inter-peak period of the day, for each city.

Trends in travel time variability are somewhat unclear, with no consistent trend in Auckland, Wellington or Tauranga in 2006 compared with earlier years. Travel time variability in Auckland and Wellington is shown respectively in Figure 4 and Figure 5.

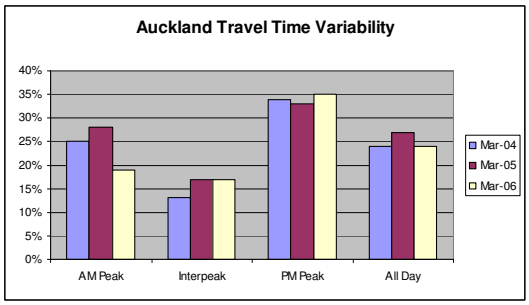

Figure 4: Travel Time Variability – Auckland

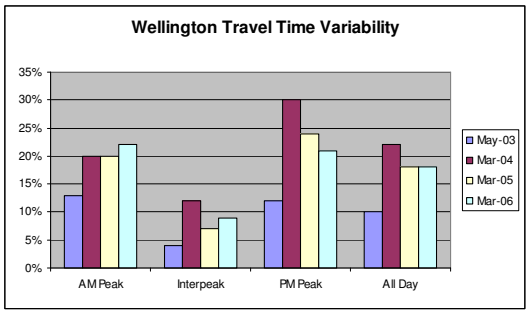

Figure 5: Travel Time Variability – Wellington

What can we learn from overseas? The best long-running analysis of congestion trends in the United States is the Annual Urban Mobility Report published by the Texas Transportation Institute (TTI 2005). Over more than 20 years, traffic congestion has been measured in 85 urban areas, together with measures of investment in roading and public transportation.

The most recent TTI report states that "the current pace of transportation improvement, however, is not sufficient to keep pace with even a slow growth in travel demands in most major urban areas." In looking at the question *"can more road space reduce congestion growth?"*, the analysis shows that additional roadways do reduce the rate of increase in the amount of time it takes travellers to make trips in congested periods. However the authors also note that the growth in facilities has to be at a rate *slightly greater than* travel growth in order to maintain constant travel times, if additional roads are the only solution used to address mobility concerns. Only four of the 85 areas studied had actually added new road capacity (lane-miles) at about the same rate as traffic growth (or within 10%). Even in these areas there had been an 80% increase in peak-hour travel times.

If the Americans (and others) have been unable to build their way out of congestion, why should we think that we could be any more successful?

3. Variability of Travel Time for Other Modes

Travel times for walking and cycling are probably more reliable than other modes of travel, although New Zealand data are not available. In the spirit of the New Zealand Transport Strategy 2002 (NZ Government 2002) and the Land Transport Management Act 2003 (NZ Government 2003), we

should consider measuring travel time reliability and congestion for walking, cycling and public transport, in addition to Transit's current surveys of motor vehicle congestion and travel time reliability on main roads.

There is some variability for walking and cycling. Pedestrians and cyclists need to wait varying lengths of time from day to day to cross roads, for example. Weather can result in some variability too, with wind, sun and rain all potentially varying travel times for these modes. And pedestrians and cyclists can choose to travel at different speeds on different days for the same trip, resulting in some variability. Typically there is more variation in "free speeds"[2] between individuals when walking or cycling compared with motorists. For example, most studies of cycling behaviour have found coefficients of variation (the standard deviation divided by the mean) of about 16% to 20% for free speeds (e.g. Rouphail *et al* 1998, Wilke 2002). In contrast, motor vehicle studies have a coefficient of variation of free speeds more like 8% to 12% (Povey *et al* 2003).

For cycling, parking tends to be more readily available close to destinations than car parking, so this would be expected to improve reliability for cycle travel relative to car travel when door to door travel time is considered. The travel time variability measured by Transit is only for the main road portion of journeys, whereas in reality, car journeys include some travel on the local road network and may include varying amounts of time as drivers look for parking and then walk from the parking location to the final destination.

The reliability of buses is likely to be compromised when they are stuck in congested traffic. In Christchurch for example, for an outbound CBD section with a scheduled running time of 4 minutes, it was found that only 63% of services in the PM peak made the trip in 5 minutes or less, and even 1% took 9 minutes or more (ECan 2003). Not only are buses delayed along with other motor vehicles because of congestion, but they may experience additional delays getting back into traffic after stopping at bus stops. These impacts can be reduced by the provision of bus lanes and traffic signal bus priority systems, which improve the reliability of buses relative to other traffic. One advantage of buses over cars is that users don't need to search for a parking space, eliminating one potential source of uncertainty and hence improving reliability.

Trains and ferries can be more reliable than travel on congested road networks, as they do not share the same congestion-susceptible infrastructure. This has potential benefits for both passenger and freight travel. Land Transport New Zealand's public transport funding support could be partially based on compliance with scheduled timetables, improving reliability for passengers and helping improve service.

One aspect of public transport is that there is some uncertainty for customers as to whether the service might run ahead of schedule, requiring passengers to be at the stop or terminal prior to the scheduled departure time. This could also be addressed by providing the right pricing signals and rewards through bus, train and ferry contracts. On-board "global positioning system" (GPS) units provide opportunities to improve information for intending passengers and to improve the reliability of public transport services and hence travel time reliability.

Fairer indicators for congestion and travel time variability (to allow rational inter-modal comparisons by users, suppliers and policy-makers) would be based on door to door travel times, not just on main highway route travel times. Some travellers have certainty at their trip ends, for example, those with dedicated employee parking for the trip to work. In other cases, however, drivers will need to search for a parking space and this could add many minutes to the trip, and much uncertainty in door-to-door trip time. Where public policy or individual mode choice decision-making

[2] "Free speed" is the speed at which a driver (or pedestrian or cyclist) would choose to travel if there were no other vehicles / pedestrians / cyclists immediately in front of them, constraining them in their choice of travel speed.

is concerned, to not use door-to-door travel times discriminates against public transport, walking and cycling in favour of car travel. To be consistent with the New Zealand Transport Strategy, this should be resolved.

Another time cost often not considered in comparing journey times by car with other modes is the time required to refuel. There is likely to be some variability in how long this takes too.

If door to door travel times were reported, through wet weather as well as dry, when crashes occur as well as when they don't, and to include occasional stops for refuelling, there would be a clearer understanding at both the individual and societal level of the travel time uncertainty of driving relative to other modes of travel. Alternatives would be more readily sought by both consumers and suppliers of transport services. Land Transport New Zealand's funding regime should be reviewed to determine whether it adequately supports modes that offer inherently more reliable travel times than privately owned motor vehicles.

4. Methodological Issues with the Transit Travel Time Performance Indicators

The methodology used by Transit to measure congestion and travel time reliability is documented on the Ministry for the Environment website (MfE 2004, section 7.4). The methodology notes that: *"survey weeks should be scheduled to avoid abnormal events such as road closures, special events, road works, school and public holidays and periods of abnormal traffic"* and *"where accidents or wet weather result in abnormally low travel speeds the surveys should be repeated."*

This method will exclude some of the common problems that frequently affect travel time for motorists. These "abnormal events", such as road maintenance and construction, crashes and wet weather, provide uncertainty in travel time for which people may need to compensate. In many ways these "abnormal events" are very much part of commuting in big cities and should not be excluded from surveys attempting to measure congestion and travel time variability. To allow valid inter-modal comparisons, the methodology should include such events, and involve a larger sample of trips to ensure that a reasonable sample of "abnormal events" is included in the analysis.

In contrast, walking, cycling, trains and ferries are often relatively unaffected by these "abnormal events", and thus provide more travel certainty. Given the amount of effort being put into "Intelligent Transport Systems" schemes in Auckland and Wellington to minimise the effects of "abnormal events" for motorists, including these events in the sample methodology would be a good way of testing whether these schemes were working.

The definition of travel time variability notes: "Travel time variability (VTT) monitors reliability of travel times on the urban arterial road system, and considers routes rather than individual links. Individual routes are comprised of a number of sequential links and should have a total route length of at least 3 km."

There are a number of flaws with this methodology for both congestion measurements and travel time variability. The congestion indicator is useful for monitoring the level of service on the main road network, but the current surveys would not be able to detect deterioration in the living environment associated with "rat-running" though local residential streets. It is possible that the congestion indicator might remain constant over a period of years while more and more traffic infiltrated though neighbourhoods. This should be of as much concern from a public policy perspective as deteriorating levels of service on main roads.

The currently-used congestion indicator would not help us make policy decisions to increase the amount of traffic calming in residential areas to counter rat-running and to maintain quality of life

there. Increasing congestion levels could encourage a policy response of increasing funding on the main road network, which may in fact be less worthwhile than other measures. These might include system-wide traffic calming in residential or CBD areas, or the introduction of bus lanes.

However, introducing bus lanes would be likely to reduce the number of existing traffic lanes available for motorists and would consequently increase congestion levels on the remaining general traffic lanes. Overall delay per person might well be reduced by such an intervention, with people in cars suffering increased delays while well-patronised buses experienced higher travel speeds. But the congestion indicator would suggest that congestion had increased.

5. Fuel Price and Supply

The concept of "Peak Oil" refers to the fact that the number of barrels of oil extracted per year from oil wells globally will eventually peak and thereafter decline (Deffeyes 2001). Peak Oil occurred in the "lower 48" United States in 1970, although the fact that oil production has been declining there since then was not able to be confirmed until several years after the event. Estimates of the year of global Peak Oil range from 2005 to 2010 and beyond. After this time, as production declines, demand is still likely to be increasing, so that shortages and price increases will become prevalent and unpredictable. Peak Oil by global production region is illustrated in Figure 6.

The recent fuel price increases in New Zealand and globally are probably influenced by the inevitable approach of Peak Oil. Fuel price in New Zealand is even more volatile, with currency exchange rates also affecting price at the pump. The fossil-fuel based transport system on which New Zealand is increasingly dependant will be less certain after Peak Oil, suggesting a need to become less car-dependant.

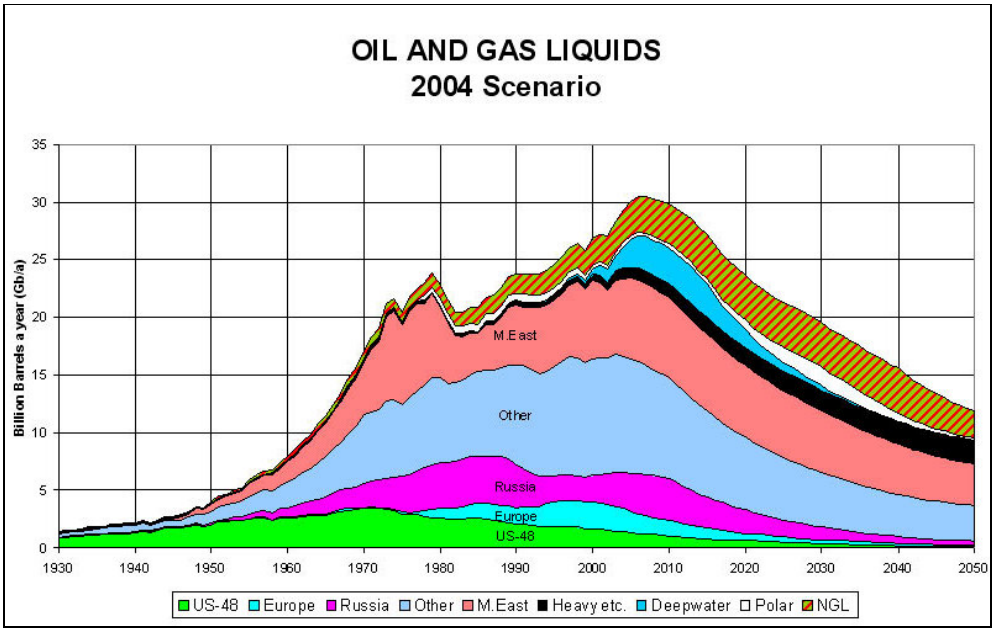

Figure 6: Peak Oil by Global Region and by Year[3]

Figure 7 shows actual versus inflation adjusted crude oil prices over the last 60 years to June 2006. Such has been the volatility of oil recently that the price has since peaked at US$78/barrel in mid-July. In real terms, the price of crude oil peaked in December 1979, but is now higher than any time since 1981.

[3] source Reader Weekly 2005

A major factor to consider in the supply and price of oil is the growth in motor vehicle use by the developing world. China and India in particular (with over a billion people each) are only just starting to become significantly "motorised" (e.g. the Chinese consume per capita only 7% to 8% of the oil of US citizens (EIA, 2006)); yet already China is the second largest consumer of oil behind the US (IEA 2006). The likely rapid growth in demand by developing countries will only further exacerbate any future oil supply and price issues.

Historically any peaks in oil prices have seen little change in travel behaviour, as motorists "ride it out" until the price falls again. With more consistent price increases recently that look set to stay now, this approach is starting to change. Already there is some anecdotal evidence that people in New Zealand are reducing their amount of motor travel (or switching to smaller motor vehicles) and taking up additional travel by foot, bike or public transport. If such trends continue, then the proposed level of investment in new roads over the coming decade will be somewhat redundant.

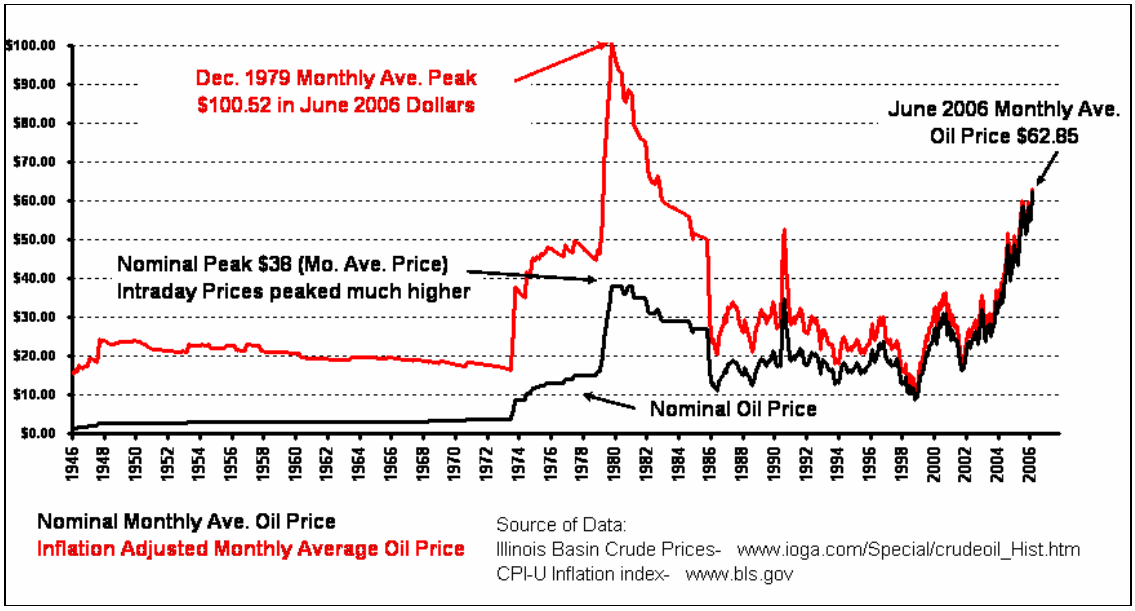

Figure 7: Inflation Adjusted Crude Oil Price, US Dollars[4]

Locally, research has begun to investigate the implications of future oil constraints on our travel behaviour and other activities (Dantas *et al* 2006). To date, this work has been able to identify the significant advantage, in terms of resilience to reduced oil supply, that better forms of urban planning (e.g. concentrated urban centres instead of "urban sprawl") would have on our travel demands.

6. Transportation Spending

Government transportation spending is at record levels – $24 billion is now programmed under the National Land Transport Programme (NLTP) over the next 10 years (LTNZ 2006). As shown in Figure 8, the roading part of the NLTP[5] has steadily increased from $696 m in the year to 30 June 1997 to a projected $1,630 m in the year to 30 June 2007. This is an increase of 134% or nearly 9% per annum (compound growth) since 1997, with even greater growth since 2004, averaging 15% per annum. Further increases in the roading part of the NLTP are allowed for in the budget for

[4] source www.InflationData.com

[5] defined as the sum of replacements, improvements and maintenance, but excluding Regional Funding

the coming years, before expenditure plateaus at about $2 billion. The anticipated roading expenditure of $2,192 m for 2017 represents a 215% increase since 1997.

The Reserve Bank reported that inflation between 2001 and 2006 was 14.2%. During this period, growth in roading expenditure increased from $846 m to $1,424 m (an increase of over 68%), thus exceeding inflation by a factor of nearly five over the last five years. The Capital Goods Price Index (CGPI), previously the Construction Cost Index (CCI), shows a change from June 2001 to June 2006 of 1104-1334, an increase of 230 or 20.8%. This is greater than inflation, reflecting the effect that cost increases in oil and construction materials have had on road construction. But still nowhere near the increase in road expenditure during the same period.

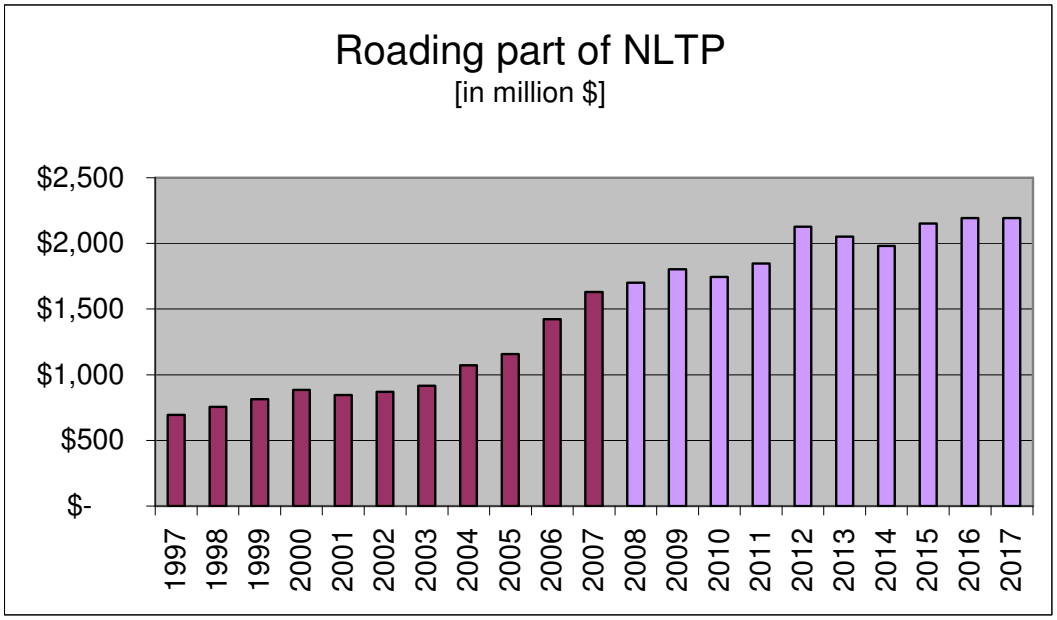

Figure 8: Annual Roading Expenditure[6]

Expenditure on non-roading components of the transport system (walking, cycling, public transport and alternatives to roading) has increased too, now accounting for $325 m. In fact, while roading expenditure has been increasing, it now accounts for only 78% of total Government land transportation expenditure, down from 94% ten years ago.

In discussing expenditure on transport through the NLTP, however, it must be acknowledged that it is impossible to determine what expenditure relates to the needs of motor vehicles and what relates to walking, cycling and public transport. Some roading expenditure improves conditions for walking, cycling and public transport. In addition, public spending on transport is not confined to the NLTP – local and regional councils contribute significantly towards transportation facilities and services (about $730 m in 2006/07, with 75% spent on roading).

The New Zealand Transport Strategy (NZ Government 2002) notes that we cannot endlessly build our way out of all our problems. Thus New Zealand's transport agencies should increasingly be working towards solutions for congestion that do not fall into the old trap of "predict and provide", where estimates of future traffic were predicted and road space was provided to accommodate it. These days should be gone – but are they? Based on the NLTP expenditure data discussed above, we appear to be still trying to build our way out of congestion.

[6] data sourced from Transfund NZ and Land Transport NZ annual reports, and from LTNZ (2006)

While congestion appears to have been increasing slightly (based on a relatively short series of congestion surveys by Transit), our roading expenditure has increased 87% (13% per annum) between 2002 (when the congestion surveys began) and 2007. Should we continue to increase road network funding levels at the same rate as the recent past, just to hold the tide on congestion? How much more should we spend to tame the congestion monster?

Why do we continue to make only small concessions to sustainable transport? Koorey (2004) suggested that there are a number of "myths" of transportation that we continue to cling to, which thus dictate public policy and decisions in this area. These include:

- The ability to "build our way out of traffic congestion" with greater road construction
- The inevitability of future traffic growth, particularly with growing car ownership
- The causal link between transport (roading) improvements and economic growth
- The unwillingness of people to change existing travel habits
- The relative unimportance of walking, cycling and travel demand management in making significant changes to our travel patterns and reducing congestion
- The ability for improved motor vehicle technologies to assist long-term sustainability
- The benefits of travel time savings from new or upgraded roads

As indicated in Koorey (*ibid*), the evidence against these propositions is mounting and should be taken seriously.

7. A Way Forward

If New Zealand is to not spend increasing amounts on roading, what should it do? The New Zealand Transport Strategy identified some sustainable transport initiatives in 2002:

Sustainable transport initiatives (from NZ Transport Strategy)	Comments on potential outcomes
A detailed investigation of surface transport costs and charges to inform future policy on sustainable transport systems. This study is to be completed in 2003. Other related modal studies will probably need to follow.	Could facilitate implementation of demand management, road pricing and congestion charging, which have significant potential to reduce congestion and improve freight delivery efficiency.
An investigation into more sustainable settlement forms and identification of the barriers to achieving these in New Zealand, as the first stage in developing a long term urban strategy.	Improved land use and transport planning integration, with consequential reductions in urban sprawl.
A review of the costs, benefits and implications of development alongside arterial roads.	Reduced need for road network expansion to accommodate erosion of arterial road network capacity.
Development of fuel consumption labelling and reporting for selected road vehicles.	Improved opportunity for consumers to choose more fuel-efficient vehicles.
A review of the relationship between Regional Land Transport Strategies (RLTS), the Resource Management Act and other strategic and planning documents. The first part of this work, to be completed in 2003, will involve a review of the processes used to develop RLTSs.	Improved land use and transport planning integration.
Development of an Environmental Capacity Analysis approach jointly with Waitakere City Council. By 2003, this will have been developed and tested. It will be promoted for use by other local authorities.	Improved recognition of traffic impacts on local streets; reduction of cut-through traffic; improved conditions for pedestrians and cyclists on local streets.
Development of the New Zealand Biosecurity Strategy, due for release in 2003.	
Investigation into further motor vehicle emission controls.	Improved air quality and health. More efficient vehicles and less fuel dependency.
Investigation into managing the climate change impacts of the aviation and maritime transport sectors. This will involve a high degree of international co-operation.	
Implement fuel efficiency labelling and monitoring for cars entering New Zealand.	Improved air quality and health. More efficient vehicles and less fuel dependency.
Continue to investigate and assess possible future policies to address greenhouse gas emissions from transport using the vehicle fleet model.	

A number of these initiatives are likely to have been completed by now. The important thing to note is that the government has been thinking of these initiatives for a number of years and some progress has already been made. But concerted action on these initiatives is now urgent and could be financed by capping roading expenditure at (say) 2003 levels. Funds already approved for transportation could thus be invested in the following areas:

- Travel demand management
- Road pricing and congestion charging
- Public transport systems
- Walking and cycling
- Improved land use planning / transport planning integration

8. Conclusions

Existing congestion and travel time variability indicators are not well suited to the needs of the New Zealand Transport Strategy. Additional indicators, as identified in the recommendations below, should be developed to assist in establishing an integrated, sustainable and reliable multi-modal transportation system.

We are not winning the war against congestion by simply building more roads. While congestion trends are still unclear in New Zealand, even in those cities where surveys have been undertaken, the common perception is that congestion is still generally increasing, despite considerable increases in funding. We can not build our way out of congestion. Accordingly, as a proportion of the National Land Transport Programme, New Zealand should invest more in sustainable transport – including travel demand management, road pricing, walking, cycling, and public transport.

9. Recommendations

It is recommended that:

1. The existing travel time surveys undertaken by Transit NZ should be continued but used only as congestion indicators for the main roads. They should not be used to report "travel time variability", as this misrepresents total travel time by ignoring time accessing parking, travel on local streets, delays through adverse weather, traffic crashes or road construction, typically part of many car journeys. Transit should also be asked to provide more context with the travel time survey reports and associated press releases, relating congestion survey results to state highway traffic volume trends and fuel price changes, for example.

2. The Ministry of Transport, assisted by other relevant agencies including Land Transport New Zealand, Transit New Zealand, EECA, Local Government NZ and the Ministry for the Environment, should develop a comprehensive suite of travel indicators that better represents a more sustainable transport system. These should include:

    - New travel time surveys to reflect door-to-door travel times for all modes including driving, walking, cycling, bus, train, ferry and freight. These travel times should include parking where appropriate, and include routine but occasional events such as wet weather, crashes, and road construction and maintenance.

    - A travel time variability indicator based on multi-modal door-to-door travel time surveys.

    - A series of transport cost indicators that track New Zealand fuel price in real terms and national and local expenditure on roads, public transport, walking and cycling.

3. Expenditure on roading through the NLTP should be capped at 2003 levels (i.e. prior to the recent 15% per annum average increases) adjusted by inflation and budgeted increases in transportation funding should be diverted to travel demand management, road pricing, walking, cycling, and public transport.

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