



Infratil

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update



10 weeks after its launch 30,000 Wellingtonians are making low-value payments (such as for a bus ride) with Snapper, which by this time next year may be widely available around New Zealand.

This Update explains Snapper and why Infratil, a utility company, is backing a payment card.

PUBLIC TRANSPORT PEOPLE WANT TO USE

In November 2005 Infratil acquired the New Zealand public transport operations of Stagecoach Group PLC, and renamed it NZ Bus. The attraction of the business was that it was well managed and in a sector with great potential for expansion.

Infratil invests in infrastructure sectors which offer growth and returns to companies which can provide good services at fair value. Public transport meets these specifications, but success will require enhancement of the business (improving the quality of services and sharpening efficiency), better relations with regional transport authorities which oversee public transport and provide funding for some services, and greater customer rapport and support.

Snapper straddles these goals, it makes catching the bus easier and quicker and it makes bus companies more efficient and provides improved information for bus companies and regional transport authorities.

The logic of increasing bus public transport is simple. As private motoring costs rise people look for alternatives. As the cost of new roads rise, the authorities look at cheaper means of reducing congestion.

Consumer Benefits



Snapper is a contactless “smartcard” with a very securely encoded computer chip.

It's very quick and different from EFTPOS and credit cards because the cash is on the card. The reader on the bus or at the merchant doesn't dial up the bank. It simply looks to the card and, in less than 0.2 of a second, transfers the cash from card to reader. There is no swiping, dial up, PIN or fumbling with cash.

Snapper is different from other public transport ticketing solutions. First and foremost, it's a payment solution. Snapper will stay up to date longer and be more relevant for both passengers and transport operators and authorities. Traditional ticketing solutions start obsolescence the day they go in and are replaced after 5 to 8 years. With Snapper the payment infrastructure will survive indefinitely. Transport operators and authorities will periodically upgrade to newer ticket machines and passengers won't be hassled by system changes.

Technology will make mobile phones, key fobs and USB sticks common devices for carrying cash and making payments – on much more than just buses and trains. You'll just “tag on” with your phone. Soon Snapper will automatically top-up by direct debit or

credit card when your balance is low. You'll always have the cash to get public transport home.

One card: Many people don't want multiple bus and train tickets. Snapper can deliver on this – regional councils willing. Snapper will lighten your wallet when it combines to be a loyalty card, ID or access control. It will also pay your parking.

Speed: Faster boardings and faster trips. Snapper reduces the average boarding time 70%, from 10 seconds to 3 seconds. It is equally quicker at a busy coffee shop.

Simple fares: Snapper delivers discounts ride by ride and early next year will support transfers between modes and passes that allow unlimited travel for set periods (eg 30 days).

Information and privacy: Some people want anonymity but many want more benefits (on-line transaction records and “hotlisting” lost or stolen cards) through voluntary registration. Snapper offers both.

Value for money: Technology should improve value. That's why the discount against cash is now 25% for GO Wellington.

Student and senior cards: They're on their way.

Bus Company Benefits

BUS COMPANIES AND MERCHANTS

Fast. A major part of a commuter bus trip is spent at the bus stop with people getting on. Fast boarding can cut minutes off trips. The trip from Wellington Railway Station to Courtenay Place (Wellington's 2.7 kilometre "Golden Mile") takes about 13 minutes at peak times with only half of that actually moving. A few minutes saved at each stop adds up to a quicker journey and a bus being able to provide more services in an average day.

Better than cash. Handling cash is expensive and creates personnel security risks. Reducing cash makes drivers safer and Snapper's payments are also easier to reconcile and track.

Putting cash onto a Snapper does impose a cost, but it is small relative to the overall benefits and loading will become more efficient and automatic over time.

GO Wellington which is the first New Zealand bus company to use Snapper is using it with "Tag On – Tag Off". This means that passengers are charged for their actual trip length.

Information. Snapper provides detailed anonymised ride-data for bus companies. As the percentage of passengers using Snapper increases the information will enable bus operators to better tailor services to user needs.

More Users. Infratil chose a "low-value transaction tool" rather than just a smart bus ticket to encourage non-bus users to have one. Over 10% of the Snapper issued so far have been acquired by people whose first intended use was to pay for coffee, food, dry cleaning, etc. But for GO Wellington those people are now that much more likely to catch the bus.

CAN YOU HACK SNAPPER?

Snapper is a new generation smart card based on the infineon, smart MX from NXP chip set. Snapper uses a cryptographic system called Triple DES which uses a 168 bit key (the bigger the number the better) to encode the data. The triple DES security is standard in financial cards and has been approved in New Zealand as a secure mechanism for connection through to the EFTPOS network.

Triple DES is considered to be secure through to 2030 because the sheer computing power that would be needed to crack the card does not exist. It has been estimated that if a computer could crack a single DES algorithm (56 bits) in one second then it would take 2 billion years continuous processing to crack triple DES security.

Regional Council Benefits

REGIONAL COUNCIL BENEFITS

Regional councils have long sought to make public transport more popular and integrated.

Integration means that when a train pulls into a station the bus should be meeting it. It also means getting users to use the network rather than just individual components. Snapper will help by providing information, for instance about how many passengers went from train to bus. And it means the passenger can have one ticket for both legs of the journey and may be charged less for the whole journey than its parts.

Because Snapper will make public transport more popular and efficient, it will also provide financial benefits to regional councils as the call on their subsidy funding will be less.

Snapper is an illustration of the best of the public – private provision of New Zealand's public transport. The private operator takes the cost and risk of introducing the system and gets the job done and the regional council can use the card to further its goals of more popular and integrated networks.

THE BENEFITS OF EFFICIENCY

The Link is NZ Bus' most popular service with almost 3 million riders a year. The service is provided by 20 low emission buses and runs between 6AM and 11.30PM, most of that time at 10 minute intervals.

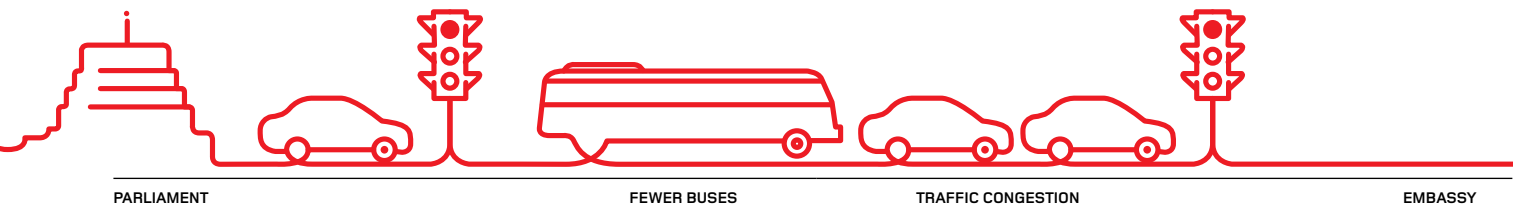
The circular Auckland route covers 13.7 kilometres and at peak times takes 90 minutes (about 70 minutes off-peak). Over the course of a peak-time circuit a bus with 100 boardings will take over 15 minutes to load passengers (10 seconds per boarding).

A contactless solution like Snapper should speed up boardings to around 3 seconds per person, which would save over 8 minutes per circuit.

Passengers get a faster trip. NZ Bus gets greater efficiency. If NZ Bus continued to operate a service every 10 minutes it could reduce its fleet by 2 buses, saving 10% of the service's cost. Or it could leave all the buses on the Link and increase frequency to one every 9 minutes rather than the current 10.

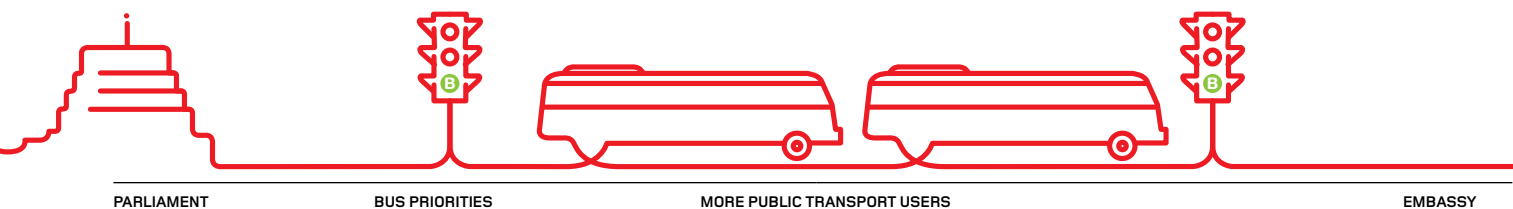
BEFORE: START TIME 6.00PM

FINISH TIME 6.13PM



AFTER: START TIME 6.00PM

FINISH TIME 6.09PM



Snapper Wellington

NZ Bus chose to trial and launch Snapper on GO Wellington because of the Capital's enthusiasm for public transport (Wellingtonians use the bus more than anyone else in Australasia) and willingness to embrace change.

For four months Snapper was trialed by GO Wellington on the Railway Station to University service so that kinks could be identified and fixed (not all were). It has been available on almost all of GO Wellington's services since August and after 10 weeks was more popular than the 10 trip ticket it was replacing.

Snapper has been brought to Wellington without a cent of regional council or central government money. It has also done it in eight months. Greater Wellington Regional Council (GWRC) has been supportive and we're discussing with them expanding the services. GWRC has a published budget of around \$15 million for an integrated fare system solution over the next eight years. Snapper will be delivering that for free on GO Wellington (done) and Valley Flyer (early 2009). That just leaves Tranz Metro and Mana (Newlands) Coach Services to go.

Getting to this point has required a huge engagement by NZ Bus, the Snapper team and their partners ANZ National Bank and Korea Smart Card Company and a little perseverance and humour from users. A few of the glitches have included:



SNAPPER MERCHANTS

Abel Smith St: Emporio Roastery & Espresso

Bunny St: The Gourmet Express

Chews Lane: Emporio

Cuba St: Nic Nacs;
San Jewellery

Courtenay Pl: Alissa's Patisserie

Dixon St: Quick-e-Mart

Featherston St: Vivace Espresso,
NYC Café

Johnston St: Mall Drycleaners

Lambton Quay: AB Fast Food -
(inside old AA building); Kirkcaldie
& Stains (books and stationery)

Lambton Sq: Lambton Square
Pharmacy; Lambton Goods

Manners St: City Stop;
Manners Mags & Lotto;
San Jewellery Mid City

Tory St: Ape Espresso;
Mall Drycleaners

Plimmer Steps: Café Mamba

The Terrace: Café Rise; City Stop;
Mi Sushi; Pasta Pasta; Liquidate

Victoria St: Mall Drycleaners

Victoria University: Vic Books,
Student Union Bldg; Uni Stop,
KelburnPde

Wellington Railway Station: Tranz
Metro Ticket Office

Willis Street: Willis Lunch Bar;
Kirby's Candies & Lotto,
BNZ Centre

Brooklyn Food Market,
Cleveland St

Island Bay Stationers,
The Parade

Karori: United Video,
Karori Mall; Video Ezy,
Karori Rd; Helen Lowry Hall

Kelburn 4 Square, Upland Rd

Khandallah Super Mart,
Station Rd; Taylors Drycleaning,
Ganges Rd

Kilbirnie: Wellington Regional
Aquatic Centre (coming soon); Pop in
Dairy, Rongotai Rd

Lower Hutt: Eat, Laings Rd

Lyall Bay: Onepu Road Dairy

Rongotai: Ramji Store, Coutts St

Roseneath: Gateway Foodmarket,
Maida Vale Rd

Strathmore Dairy, Broadway;
Raukawa St Dairy

Thorndon: Café Saint Paul; Groom
Barbers, Tinakori Rd; New Zealand
Drycleaners, Molesworth St;
Thorndon City Shop, Molesworth St

Wainuiomata Rd: Mall Drycleaners

Wellington Airport: Cargo

Wishbone stores throughout
Wellington and the airport

Wakefield St: The City Service
Centre, Wellington City Council

Selected **Subway** Stores in
Wellington

StarMart stores in Wellington
and Auckland CBDs (under new
ownership and to be rebranded
StarMetro)

Problem	Solution
Cards which should have had value loaded on them not showing the credit when "Tagging On" to a bus.	Bus drivers have let people ride free when there is an obvious honest shortcoming. The cash-loading problems have been solved (sorry no more free rides for that one).
On-bus ticketing systems turning off.	It turned out that GO Wellington's buses had less stable electrical systems than what the system was used to in Korea. Snapper is solving this by allowing the ticket machines to operate through a wider voltage range.
It just doesn't work!	Initially many passengers tended to wave their Snapper at the reader. A couple of practises at holding it to the reader has shown them the right way.
My daughter wants one!!!	The main complaint is a good one to get. Children can't use Snapper to pay a child fare unless dates of birth can be added to the card. The reader at the door then quickly calculates whether a child (or senior) fare is payable. This feature is being added in time for school next year.
I forgot to tag off!!	Less than 2% of users initially forgot to tag off and incurred a higher fare than they may have needed to. Wellingtonians quickly got the hang of it.

Why is public transport ticketing so difficult?

- When a card is presented to a reader on a bus or train information needs to be exchanged between them:
 - What's the time? Is it peak/off peak?
 - Where is the bus? If fares are distance or zone based the system needs to know where you got on and where you got off. This means live time integration with GPS.
 - Are you a senior, child or otherwise entitled to concessionary fares?
 - Have you just transferred from another service and entitled to a lower fare as a continuation of your journey?
 - Do you have a pre-paid pass that gives unlimited travel or have you already spent your daily price limit making this trip free (like can happen in Christchurch)?
 - Do you have sufficient money on the card to pay for your trip? What if you just have \$1.00 - which is enough for the one zone trip you're taking but not enough to go to end the journey?
 - Snapper can do all that in 0.2 of a second – and then do it all again when you get off to calculate the right final fare.
 - Public transport is a harsh environment. Equipment needs to operate outdoors (platform vending machines) and in buses that hit potholes and can have unstable power supplies.
- Then there are the business rules specific to each and every transport operator and authority:
- Are fares charged by distance (as in Seoul) or zone (as in Wellington)?
 - Is a child fare under 15, 16 or 18 and what about 16 year olds who've left school? What if it's under 16 for one operator and under 18 for another? Can Snapper deal with this (it can)?
 - How are fares apportioned between operators when a passenger catches a bus to a train as part of one journey?
- And no-one should forget the operators. They serve the passengers every day of the year. They need systems that are completely robust and reliable and that their staff (especially the drivers) are confident about using.

Snapper is aligning itself with leading public transport systems and payment schemes around the world. The much admired Octopus scheme in Hong Kong and T-Money in Seoul both combine contactless card payments on public transport and an extensive range of merchants. You buy an Oyster card at Hong Kong airport and use it to get into town, travel around, buy lunch, get into a swimming pool or go to a convenience store. There are 2,000 retail outlets that accept Octopus and 16 million cards on issue doing 10 million transactions a day. That's with only 7 million people.

In the United Kingdom, Barclays Bank is upgrading 1 million customers to contactless cards and will have contactless readers in 15,000 shops by the end of the year. They too are focussing on small value transactions (up to £10) for "time poor" users to buy newspaper, lunch and coffee.

Snapper is on the crest of a wave that can only be good for increasing public transport use.

Risk and Cost Matters: Dealing with this complexity is expensive and risky. There are too many failures to ignore. Snapper recognised that developing a sophisticated solution for New Zealand would likely be too expensive. Apart from the development risk, there just aren't enough public transport journeys each year to cover the capital and development costs. The new Melbourne scheme may now cost more than A\$1 billion to develop and operate. In the major centres in New Zealand there are just more than 100 million journeys a year. That's less than five days of Seoul.

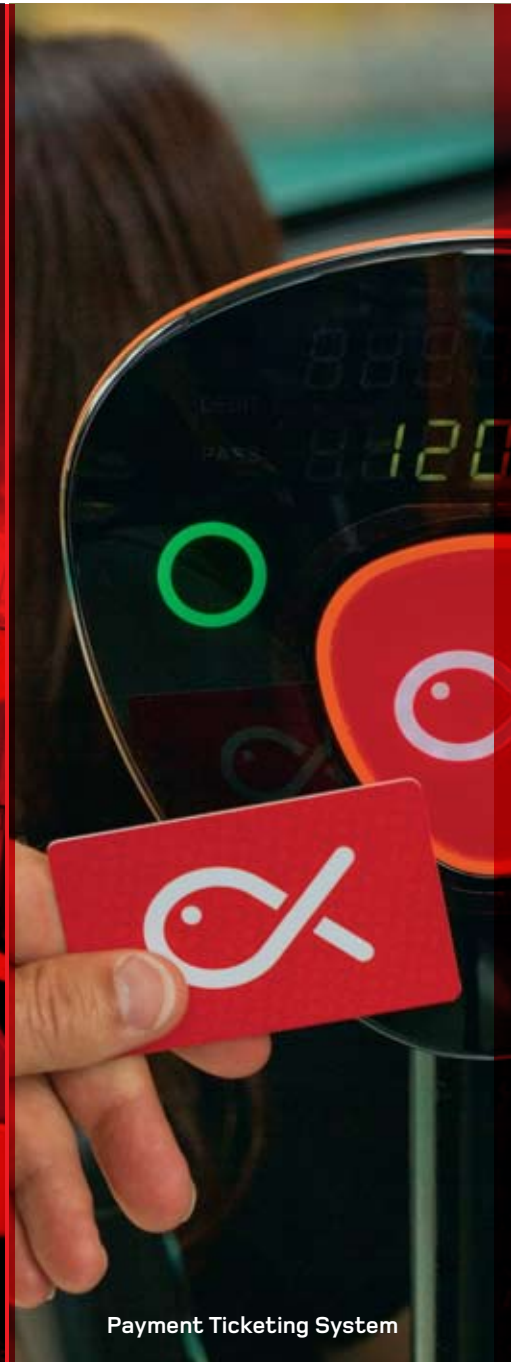
Snapper substantially reduced the risk by piggybacking off the Korea Smartcard Company system (KSCC) and, with the help of some leading and innovative New Zealand companies, customising for our market. We use KSCC's existing infrastructure to process the transactions and pay on a marginal cost basis. But even with that advantage the system may be too expensive for New Zealand. So Snapper started with broader ambitions to process non-public transport payment transactions from Day 1 and move into loyalty, access control and identity. This spreads the cost allowing a lower risk and cheaper product to be provided to public transport operators and authorities.

Bus Company



Driver

Bus



Payment Ticketing System

Public transport involves a partnership of operators and city, district and regional councils.

AT PRESENT:

Operators provide buses and ferries, drivers, ticketing, and all the background operations required to make services work reliably and safely.

City & District Council



Roads & Bus Lanes



Bus Priorities

Bus Stops

City and District Councils provide the roads and infrastructure associated with buses such as priority ways, bus stops and traffic lights.

Regional Council

Funding



Network



Trains

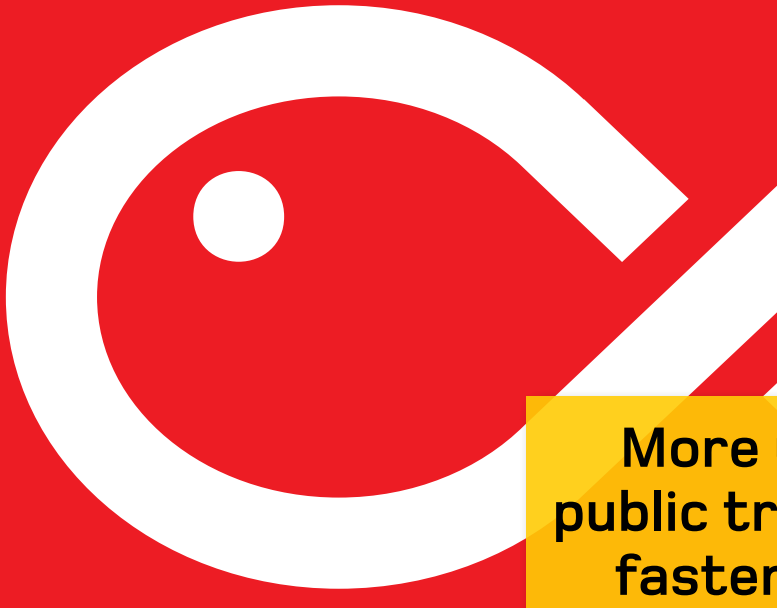
Real Time Information



Regional Councils provide the overall network plan and set service levels and maximum fares, contract operators on subsidised routes and they also provide trains in Auckland and Wellington.

Infratil and NZ Bus strenuously opposed the passing of the recent Public Transport Management Act. Regional councils and especially Auckland Regional Transport Authority (ARTA) successfully lobbied for it. All sides agree that successful delivery of public transport services is a partnership but strongly disagree about allocation. Infratil believes that service quality and innovation comes from the operators. The operators face the public each and every day and know what they want. That's why Infratil has provided NZ Bus and Snapper with the capital to significantly improve the fleet quality (for example the low emission Link buses in Auckland and the new trolley buses coming into service in Wellington) and NZ Bus has placed such an emphasis on creating new brands (Valley Flyer, GO Wellington, GO West, North Star and Metrolink) and associated new training and higher service standards. It has also provided the capital to establish Snapper.

Snapper



NZ Bus



More use of public transport, faster trips, save money, and less traffic congestion.

Wellington City Council



Greater Wellington Regional Council



Infratil believes in the “net” contract model where operators take the revenue risk from patronage. That is, if less passengers travel then the operators earn less but if more travel they earn more. There can be no better incentive to lift quality than allowing the operator to keep the marginal ticket revenue or to punish poor service by leaving the revenue loss with the operator. Infratil also believes in “commercial” services running alongside “contracted” services. Commercial services receive no public funding at all. The operators take 100% of the risk in establishing these services and encouraging patronage. If they are successful then the passengers get the service and the local regional council can use its limited funds to contract for services that wouldn’t otherwise be provided. It’s hard to see how this cannot result in more services being provided. It is the incentives that net contracts and commercial services provide that attract private sector capital to public transport, drive service extensions and quality improvements and ensure that regional councils get value for money. The Airport Flyer in Wellington is a very popular commercial service that wouldn’t exist unless NZ Bus had been prepared to take the risk on

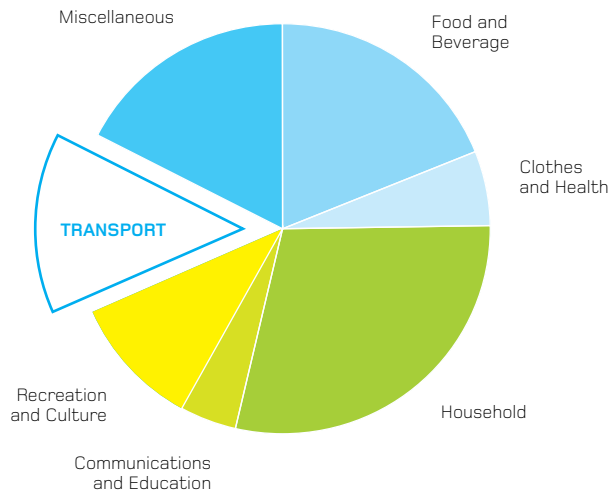
establishing it. Initially five buses were bought and as demand lifted this increased to seven and then nine. Significant losses were incurred following the introduction of the service, and each time it was increased, until demand grew. (All of this at no cost to the ratepayers). The Link in Auckland is another example of taking commercial risk to create a highly valued service.

ARTA believes service quality improvement and patronage growth comes from centralised control, “gross” contracts (where ARTA takes the revenue risk from patronage and pays the operators, effectively, on a cents per kilometre basis) and removal of commercial services.

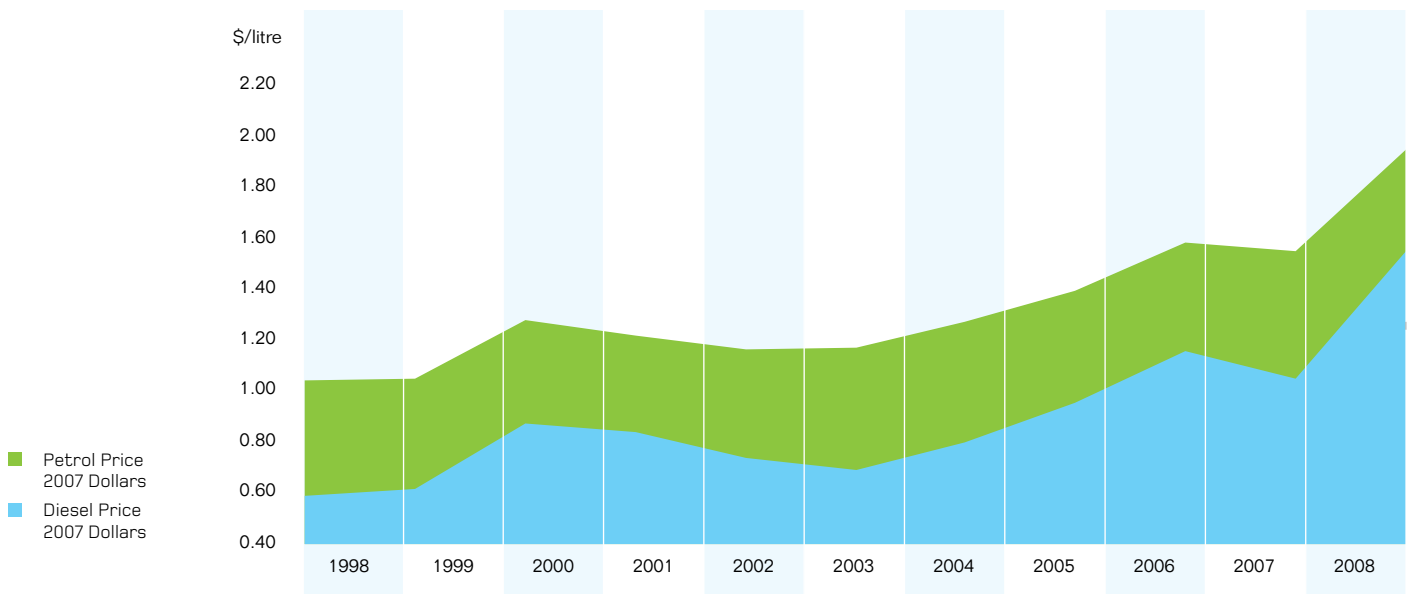
Exactly how regional councils and ARTA use their new powers remains to be seen. Infratil will continue to lobby for an industry structure that it believes increases service quality, grows patronage and provides ratepayers, and central government with lower risk and the best value for money.

Better Transport Choices 2009 and Beyond

AVERAGE WEEKLY HOUSEHOLD CONSUMPTION \$960 (YEAR TO 30 JUNE 2007)



NZ'S COST OF FUEL



NEW ZEALAND NEEDS BETTER PUBLIC TRANSPORT

In the year to 30 June 2007, over 12% of average New Zealand household spending was on private motoring (the most recent Department of Statistics figures). In August 2008 when fuel prices were at their peak the average cost of petrol or diesel was over \$60 a week per household, or about 6% of total average household spending.

Oil is now New Zealand's largest single import item amounting to a cost of \$6.7 billion for the year to March 2008.

Individuals are responding to higher fuel costs by buying smaller vehicles, but public transport also has the capacity to help reduce household travel costs and to reduce the country's dependence on imported fuel and the need to invest enormous sums in increasing road capacity. Public transport use is rising, but there is a strong case that Government could spend less on transport and still get more were it to alter its priorities.

WELLINGTON: TRACK RECORD

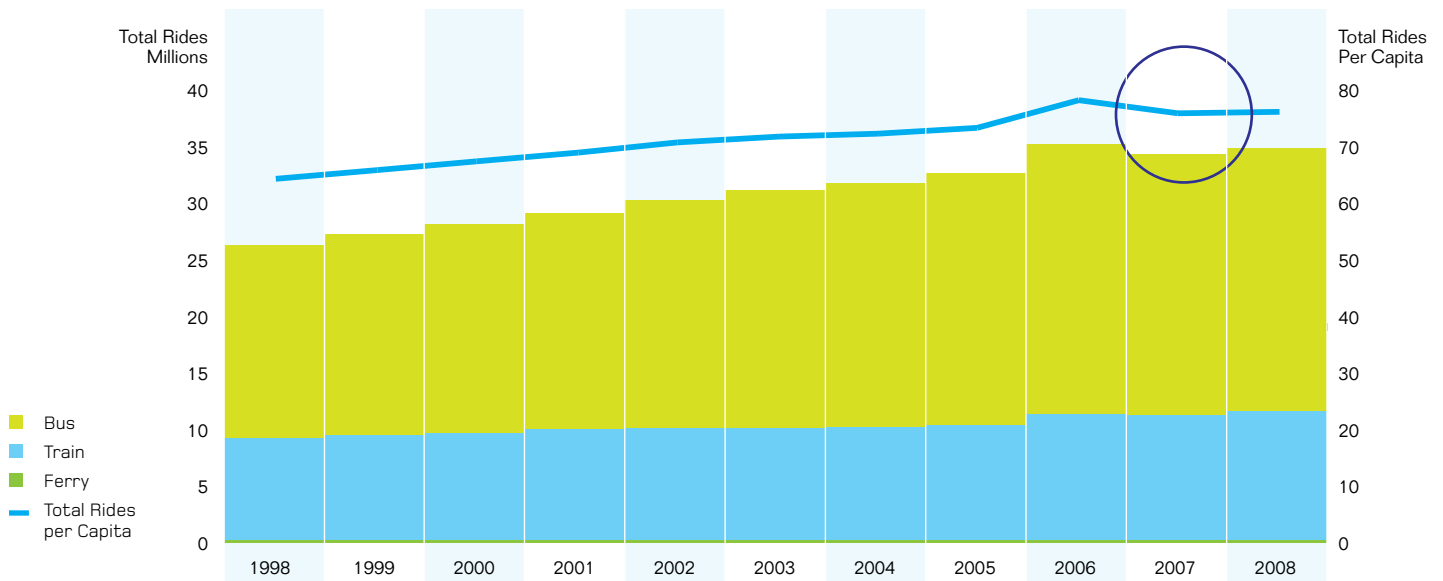
Over the decade the Wellington region's use of public transport has risen from 64 rides per annum per capita to about 76 rides.

The 2007 fall in patronage illustrates the main problem of delivering faster growth. In 2006 a surge in petrol prices resulted in a lot more people using public transport. There was insufficient spare capacity to absorb the increase. Buses became crowded and slower. When fuel prices fell, people got back into their cars.

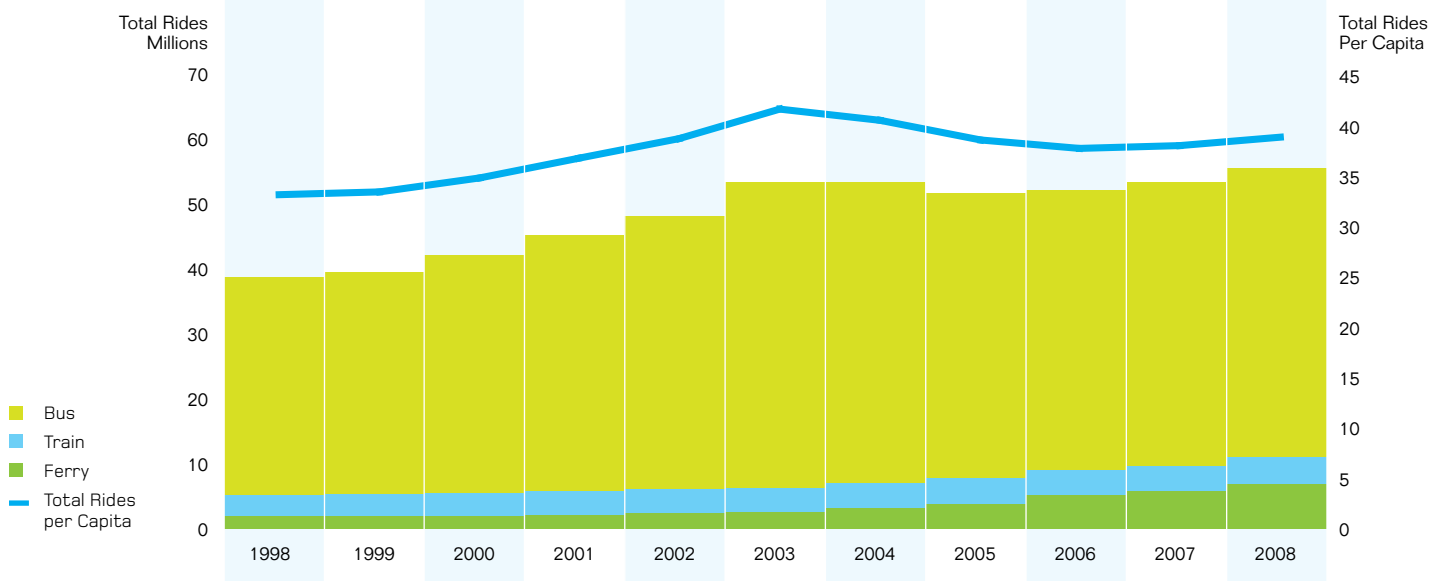
Faster public transport growth requires public and private investment in capacity so demand can grow into it. Infratil is concerned that the new Public Transport Management Act will discourage private investment and materially hinder growth in capacity.

Even though regional council funding is matched by government grants on a 50/50 basis they are under financial pressure to minimise rate increases which means they are struggling to maintain existing services which have incurred higher road-user, fuel, wage and bus costs. In addition, further depleting funds, both the Wellington and Auckland regional councils are currently undertaking "catch up" spending on their train networks.

WELLINGTON PUBLIC TRANSPORT RIDES



AUCKLAND REGION PUBLIC TRANSPORT USE



Operators such as NZ Bus have historically been willing to invest in spare capacity where growth seemed likely, but the recently enacted Public Transport Management Act deters this because regional councils now have the legal ability to impose contracted services where privately run ones are operating which naturally discourages investment in such services.

AUCKLAND: TRACK RECORD

Auckland's increased use of public transport from 32 rides per capita per annum to 38 is a good result in the context of the region's ingrained bias in favour of the car. As with Wellington, people will use public transport if it is available, and many Aucklanders still feel that suitable services are not available.

The key impediment to faster roll-out of better bus services is a lack of money (public and private). Auckland does have its own particular challenge as incremental funding has tended to go into infrastructure and trains. The \$300 million spent on the North Shore Busway and several times that on improving the trains may be a good allocation of resources over the long term, but it has meant depriving most Aucklanders of better public transport so that a few can have a major upgrade.

2009

Infratil's investment in public transport was based on the simple logic that more people catching the bus to work or school would be of financial benefit to users and transport authorities. A good bus system is a lot cheaper and more effective for both parties than a good commuter rail system or increased road capacity and private motoring.

If the allocation of local and central governments' approximately \$3.5 billion of annual transport spending was undertaken efficiently it would effectively measure the costs and benefits of roads – rail – bus and would allocate funding to the latter. At present this is not happening, but the logic remains, as does the flawed allocation process, at least for now.



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