# Roundabout

Magazine of the Transportation Group NZ

Issue 157 September 2018


## Are we there yet?
### The state of gender diversity in our industry

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*- Te Reo on trains - "Getting confused at a higher level"*
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Roundabout is the magazine of the Transportation Group NZ, published quarterly. It features topical articles and other relevant tidbits from the traffic engineering and transport planning world, as well as details on the latest happenings in the NZ transportation scene.

All contributions, including articles, letters to the editor, amusing traffic related images and anecdotes are welcome. Opinions expressed in Roundabout are not necessarily the opinion of the Transportation Group NZ or the editor, except the editorial of course. There is no charge for publishing vacancies for transportation professionals, as this is considered an industry-supporting initiative.

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Roundabout is published around the 15th of March, June, September and December each year, and contributions are due by the 10th of each publication month.

A monthly Mini-Roundabout email update is circulated on the 15th of in-between months and contributions are due by the 12th of each month.

If somehow you have come to be reading Roundabout but aren't yet a member of the Transportation Group NZ, you are most welcome to join. Just fill in an application form, available from the Group website:
www.transportationgroup.nz

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# Editorial

Time for my semi-annual transport commentary about my family holiday. This edition is brought to you by the island paradise of Vanuatu.

I loved the laid back atmosphere and outstanding beauty of Vanuatu. I would definitely recommend it as a holiday destination, though it is a bit more rough-and-ready than pampered resorts in Fiji (if that's your thing).

The first thing you should know about Vanuatu is that the roads haven't been maintained since 1983, going by the depth of the pot-holes.

And there is no speed limit. Well there might be one (I never saw any signs of it) but it is pretty pointless, as the poor carriageway condition keeps the speeds down.

***So to best reduce NZ's appallingly high road 'toll' we should stop maintaining our roads, dig a few pot-holes and remove any protective barriers.***

I actually had an epiphany whilst observing the driving behaviours. When we in NZ build smooth, wide roads with extra shoulders that allow a bit of room for driver error, the result is higher traffic speeds.

Quite obviously in Vanuatu the opposite is also true. So to best reduce NZ's appallingly high road 'toll' we should stop maintaining our roads, dig a few pot-holes and remove any protective barriers. There are no street lights to speak of in Vanuatu, again this appears to slow drivers down.

They also have a deficit of footpaths in Vanuatu but I couldn't find any redeeming qualities in that situation.

The reason for the appalling road condition is rumoured to be that some bulldozer operators drive along the roads to get to a construction site, rather than being taken on a truck (the roads are pretty windy and narrow, too narrow for a bus - so maybe a big truck won't fit). Or the roads could just be poorly built and under-maintained.

Some other observations – bus services are provided by pretty much anyone with a minivan. They will happily pick up anyone for a small fee and then put their hazard lights on when the minivan is full. This makes it hard to tell when the minivan might be turning, but (much like NZ) indicating whilst driving appears to be voluntary anyway. If a driver really wants to indicate, they can just casually point out the window.

*Typical Vanuatu carriageway - a bit bumpy, no footpath or drainage*

I only saw a few road signs, and as you can see in the below photos they might not strictly comply with the signs manual.



There are no street name blades, just descriptions of houses in or near particular villages. This seems to work for minivan services but I still haven't figured out how mail gets delivered. Or if people in Vanuatu get mail.

I apologise for the oversimplification of the Vanuatu transport system. I loved the country and don't wish to disparage it. Definitely go visit some time. Just be prepared for a slow bumpy ride in a minivan.

TRANSPORTATION GROUP NEW ZEALAND

***Daniel Newcombe***
***Roundabout Editor***
***@newcombe_dan***

# Chairman's Message

While you are reading this, take solace in the fact that I will be suffering the pain of international travel and complicated foreign road rules.

Ok, I'm in Hawaii, so you can all sympathise with my pain, no? Well at least I can inflict tropical traffic anecdotes on you next time…(hey, I've already done that - Ed.)

The state of our transportation industry continues to cause concern. With a refresh in the GPS and long overdue reallocation of priorities towards a more balanced approach to movement of people and goods (rather than making car trips faster), we have suffered a hiatus in programme delivery and an NLTP that is almost a year overdue.

It feels like nothing has come to market for that year. However, I'm still busy and so is everyone I have spoken to in the public and private sectors, so when this "tsunami" of projects appears, desperate for delivery, who is going to do them?

I am following with interest the plan announced by Minister Jones to establish a national infrastructure 'entity' in 2019. Whilst this is an all-encompassing agency(?), transport infrastructure will undoubtedly make up a significant part of its remit.

This is not a new idea, was mooted by the previous government and is already practised in Australia and Europe.

Apparently the Treasury Infrastructure Unit does not have enough clout to be effective in instigating change. Anything that will streamline and improve delivery can't be a bad thing right?

***When this "tsunami" of projects appears, desperate for delivery, who is going to do them?***

Unless it adds a layer of bureaucracy and another set of gatekeepers. Again, I'm keeping an open mind until some details are published.

I do wonder how it will work with the current funding allocation system. Will it enhance or reduce the influence that the Transport Agency has? Will we see another restructure of the Agency, separating the funding arm out again?

Cycling is also causing concern nationally, with a high number of serious injuries and deaths recently reported in the press. As a cyclist and weekend "lycra warrior" I feel more vulnerable on our roads than ever. What is causing this growing trend? Possibly more exposure with an increased number of cyclists out there.

As a nation we rank 4th in the world for cycle growth as a mode at 6%. Tauranga apparently has the fifth highest cycling growth of cities globally. But with this increase in vulnerable road users there is an increased responsibility for drivers to take care. We don't appear to be able to look where we are going.

From what I've witnessed, distracted driving is prolific, with literally hundreds of drivers with their attention on cell phones or something else. We don't need to wait for autonomous vehicles because "driverless cars" are already here. This also extends to numerous pedestrians who are texting and checking social media rather than paying attention. Driverless cars and heedless pedestrians in our crowded urban areas, what could possibly go wrong?

Electric vehicle update… I have seen a new initiative run by Mercury in Auckland. You can lease an EV with no minimum period for as little as $400 a month from www.evdrive.co.nz

Apparently all you do is subscribe and that's it - you get the vehicle delivered and all you do is drive it and charge it. Rego, WOF, insurance and servicing are all included.

This is a brilliant idea and is a step towards Mobility as a Service (MaaS) and a non-ownership private transport model.

I hope you have taken the opportunity to look at our new website, it is way better than the previous incarnation. Thanks to Jenson and Daniel for putting this together.

Please also support your local branch and remember if there is anything you want to see happen, please tell us as we want to give you what you want. On that tack, did you complete the members' survey?

**Alan Gregory**
**National Committee Chair**

# History lesson - the first person in NZ to die in car crash

A South Canterbury farmer's wife and mother of one, Janet Meikle, was the first person in New Zealand to be killed in an accident caused directly by a car.

The driver, she died in September 1906 when returning with her husband John to the farm, Table Downs, at the head of Washdyke Valley. They had gone to Timaru, about 8km away, for a Saturday afternoon.

"Jack I'm dying," were her last words, John told an inquest.

Janet, aged 36 and the mother of a 4-year-old girl, was an experienced motorist. She had been driving for about two years. New Zealand had had cars for only about seven years.

The couple arrived home in the 8 horsepower De Dion car about 4pm and were on the farm's driveway when the accident happened. Descending a steep, narrow cutting on the side of a spur, the car swerved inwards at an awkward bend.

Janet over-corrected slightly with the steering and the vehicle left the track. It ran a short way down the side of the spur and broke a fence post as it tipped over the fence into a paddock.

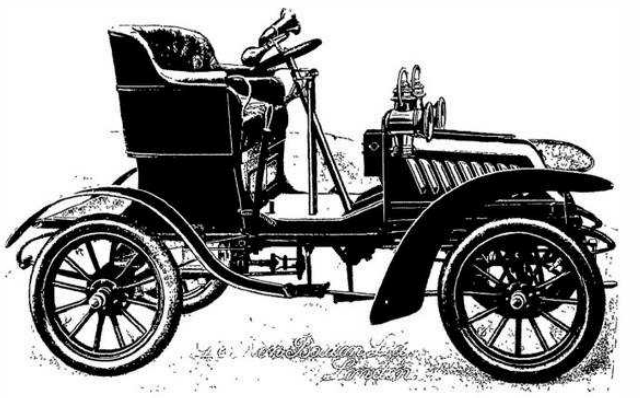
As the car capsized, John was thrown clear, but the side of the vehicle fell on Janet's lower chest and pinned her tight.

With a broken upper leg, John crawled towards their house until a servant, Grace Robertson, heard his cries for help. She came and with a spade tried to dig beneath Janet to relieve the pressure, but the car kept slipping down too.

Grace ran for another worker, who was ploughing about 1.5km away. He brought horses and rope and pulled the car off Janet, but it was too late. She had suffocated.

The fate of the car that killed Janet Meikle isn't clear. A De Dion was one of the first pair of cars to be driven to Mt Cook village, in February 1906, and it has been displayed at the Sir Edmund Hillary Alpine museum there.

Some believe it became the Meikles' car after its historic journey.



8 H P. DE DION LIGHT CAR.

Early motor-vehicle-related deaths

• 1902 - Claude Smith died when thrown from a trap whose horse was startled by an oncoming car in Christchurch.

• 1905 - Alfred Price was the first in New Zealand to die in a motorcycle crash. The rider, he was killed by a late-night incident involving a train in Dunedin. He fell from his motorbike, but it wasn't clear if there had been a collision.

• 1905 - Mrs Winsloe, 45, was the first car occupant in New Zealand to die in a crash. A car passenger in Gore's main street, she died soon after the car and a horse-and-trap collided. The horse shied when the trap rattled over a culvert and a protruding harness shaft hit Winsloe. The trap driver, John Whittingham, had a charge of manslaughter against him dismissed before it went to a jury trial.

• 1906 - George de Montalk, one of four passengers in a swerving Wolsley car, was killed by its collision with a night-soil cart in Christchurch. The group had been out for a long night of drinking "shandies" at hotels between the city and Prebbleton, a court heard. The driver, William Thomas Fenton, was acquitted of a manslaughter charge.

• 1906 - Amy Kensington was hit and killed by a fire engine on a central Wellington street and one of her daughters was injured. Amy's husband, Under-Secretary of Lands William Kensington, witnessed the immediate aftermath of the accident by looking out a window of his government building.

*Source: NZ Herald*

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TRANSPORTATION GROUP NEW ZEALAND

# Hemo Rd roundabout wins Golden Foot award

Rotorua's Hemo Rd roundabout has received an award but not for the increased safety it gives to motorists.

The roundabout has won the Connecting Communities Award at the Golden Foot Walking Awards held in Wellington recently.

The Golden Foot Walking Awards are run by Living Streets Aotearoa, a NZ organisation for people on foot that promotes walking-friendly communities.

Roundabout project manager Fred Shilton from Opus International, was in Wellington to collect the award.

He said it was great to be recognised for something that was "to the side" of a transport project.

"The State Highway 5/State Highway 30 Hemo Rd intersection had been ranked as the fourth-riskiest intersection in the country by NZTA," Shilton said.

"While our design focus was directed at ensuring improved safety to road users, the safety of cyclists and pedestrians was also one of the objectives.

"I always knew it was an award-winning roundabout, it's nice to be able to say it is," he said.

The $7.3 million contract to build the roundabout was awarded to Fulton Hogan and construction began in April 2016.

Project objectives
- Increase safety at the high-risk intersection
- Enhance connectivity and integrate with the surrounding area and local roads
- Provide cycle and pedestrian access across the state highway and integrate it with the national cycleway
- Create a gateway to Rotorua in partnership with the council and local tourism businesses
- Provide enhanced stormwater treatment

# Te reo Māori annoucements on Auckland's trains

The first Auckland train service to have te reo Māori announcements left Britomart Station recently and ran to Onehunga.

Since June all Auckland train services have had te reo announcements, which was timed to coincide with Matariki.

Independent Māori Statutory Board deputy chairman Glenn Wilcox says this is a major step towards bringing te reo into the everyday lives of Aucklanders.


"This is about making sure te reo is heard in Auckland, and about encouraging people to learn the language. By hearing their language everyday, I am hoping people will seek it out and understand that te reo makes Auckland unique, it is the world's largest polynesian city. I'm pleased to see that Auckland Transport has taken the step to make this happen.

"The Independent Māori Statutory Board has worked with the Auckland Council family to make te reo more prominent across the city. By exposing more people, and particularly our young people, to te reo, this will only make Auckland a better place."

This is the first stage in the te reo on public transport programme, and features the main safety announcements and the beginning and mid-point of the journey. The next stage will include an enhancement of the current messages in te reo throughout the journey.

Minister of Transport Phil Twyford says, "It's great to see this initiative by Auckland Transport, making te reo Māori a part of many Aucklanders' daily commute."

AT's Chief Executive Shane Ellison says a lot of thought and effort has gone into making this project a reality.

"Bringing te reo onto trains is very exciting, and we're really proud of it. If Auckland Transport can bring the joy and importance of the language to more people in Auckland then that's a big step in the right direction."

The introduction of Māori language on trains is Auckland Transport's contribution to Auckland Council's Māori Language Policy.

This policy recognises te reo Māori as a cultural treasure and an official language of New Zealand and is New Zealand's point of difference in the world.

AT is committed to the Māori language being seen, heard, spoken and learnt throughout the transport network. The announcements have been recorded by actor and television presenter Miriama Smith.

# Trial of E-vehicles in transit lanes ends

The NZ Transport Agency will no longer give priority to electric vehicles on a number of congested motorway on-ramps, following a year-long Auckland trial.

The trial of EVs being allowed to use 10 high-occupancy (T2) lanes and one bus lane, even if there was only one person in the vehicle, has ended.

The aim of the trial was to encourage Aucklanders to switch to electric vehicles (EVs), but a survey of EV owners suggested being able to use T2 lanes to get onto the motorway was not a significant factor in their decision to buy.

EVs being better for the environment, cheaper to run and the perception of being an early adopter were much stronger motivators when it came to making the purchase decision, NZTA general manager customer design and delivery Charles Ronaldson said in a media release.

The NZTA-run trial was part of the Government's push to get 64,000 electric vehicles on New Zealand roads by the end of 2021.

Over the next few days, drivers of EVs around Auckland would notice priority lane signage being amended in the lead-up to the expiry of the bylaw which enabled the trial.

# $1B Government road safety boost

The Government will inject an extra billion dollars into road safety. Over $4 billion will be spent over the next three years to reduce deaths and serious injuries on the roads over the next three years.

$3.1 billion will be spent on local road safety and state highway improvements, focussing on high-risk areas and intersections, through the 2018/21 National Land Transport Programme (NLTP) investment. Transport Minister Phil Twyford says it's $1b more than what was allocated in the 2015/18 NLTP.

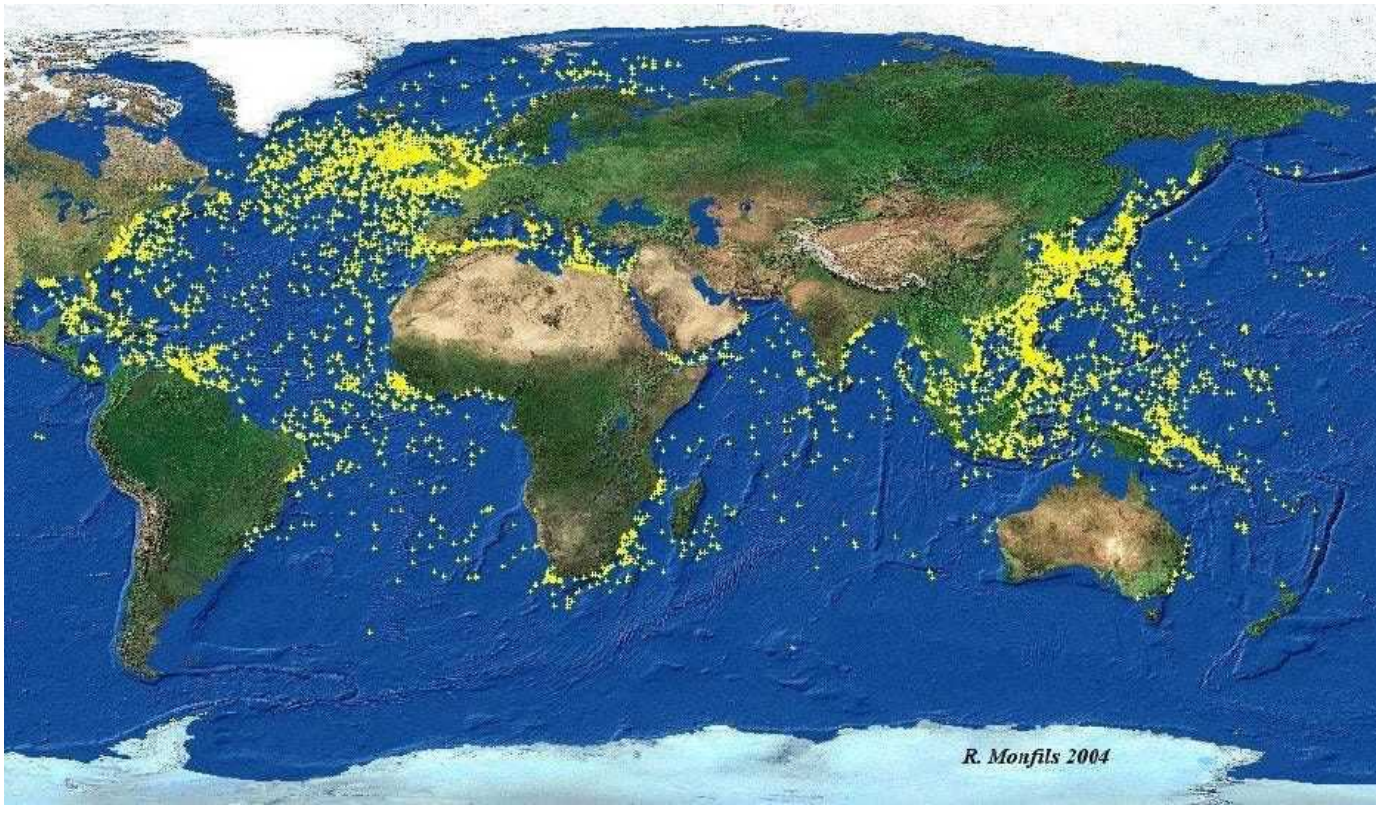
An additional $1.2b will be spent on road policing and road safety campaigning.

Caroline Perry from Brake NZ says the extra investment is a great start and the group is glad to see the Government taking road safety seriously.

"The number of deaths and injuries is horrific and we need to reduce the number of deaths and injuries we've seen on our roads in the last few years," Ms Perry said. "What we now need to see is that the plan covers a lot of proven safety measures."

The organisation wants to see a range of safety improvements including reducing speed limits on high risk roads, installing more median barriers, and safety measures for pedestrians and cyclists.

Ms Perry said more investment will be needed over the longer term to ensure there is a lasting reduction in deaths and injuries on the roads.
*Source: Newshub*




*Map of World War Two shipwrecks*

# Transportation Engineering Postgraduate Courses 2019 provisional

**Department of Civil & Environmental Engineering University of Auckland**
**For Master of Engineering Studies [MEngSt] and Post Graduate Certificate [PGCert], with / without Transportation specialisation, or for a one-off Certificate of Proficiency, COP**

## Semester 1 (Mar-Jun 2019)

| | |
|---|---|
| **CIVIL758 – Traffic Systems Design (Monday & Tuesday, three hours / week, 12 weeks)** | Traffic signal timing analysis, gap acceptance parameters, intersection analysis of performance (priority, roundabouts, signals), introduction to transportation planning and modelling techniques, RMA and other requirements, computer modelling and simulation. |
| **CIVIL765 – Infrastructure Asset Management (20-22 March & 15-17 May)** | Advanced theories and techniques fundamental to the management of infrastructure assets, with a focus on Asset Management Plans. Covers the entire spectrum of infrastructure, including roads, water networks and buildings. A major project incorporates a literature review, selection and critical review of an industry AMP. |
| **CIVIL769 - Highway Geometric Design (28-29 March, 9-10 May & 6-7 June)** | An advanced course in highway geometric design techniques. Through the use of an independent applied project, students will apply advanced theory, methods, processes and design tools to the safe design of highway geometric alignments that includes an understanding of human / driver behaviour characteristics. |
| **CIVIL770 - Transport Systems Economics (14-15 March, 2-3 May & 30-31 May)** | Advanced specialist topics in transportation economics including economic analysis, theory of demand and supply of transport, govt. intervention policies, and externalities and agglomeration. A research project analyses 2 major transportation infrastructure projects to determine likely future social benefits and dis-benefits. |

## Semester 2 (Jul-Oct 2019)

| | |
|---|---|
| **CIVIL759 – Highway & Transportation Design (Monday & Tuesday, three hours / week, 12 weeks)** | Economic and environmental assessments of transport projects. Road safety engineering. Crash reduction and prevention methods. Pavement asset management. Pavement rehabilitation techniques. Heavy-duty pavements, highway drainage and chip seal design. |
| **CIVIL762 – Transportation Planning (7-9 August, 2-4 October)** | Provides an in-depth exploration of various components of the urban transportation planning process, with emphasis on theories on modelling. Conventional four-stage transport planning model principles, trip generation, distribution, modal split and assignment, are covered. |
| **CIVIL766 – Road Asset Management (14-16 August & 25-27 September)** | Advanced topics in road asset management - develops a critical awareness of the key issues encountered, including the evaluation of functional and structural performance; risk management; deterioration modelling and calibration; prioritisation and optimisation. Core skills are extended by a complex road asset management problem. |
| **CIVIL 771 – Planning & Managing Transport (1-2 August, 29-30 August & 17-18 October)** | An advanced course on integrating land use planning and transport provisions, including planning for different land use trip types and parking, travel demand management techniques, and intelligent transport systems. An independent project applies this specialised knowledge in planning, designing and managing transport infrastructure. |

NOTE: Other relevant courses at the University of Canterbury (e.g. Civil / Transportation) or at Auckland (e.g. in Civil / Construction Management) or elsewhere can be suitable for credit – prior approval is required.

For Admission / Enrolment inquiries contact: **Assoc. Prof. Roger Dunn**, Director of Transportation Engineering
Phone: (09) 923 7714 DDI, Mob 021 309 600 Email: rcm.dunn@auckland.ac.nz

**Further details, including the course outlines, can be found at:**
*http://www.cee.auckland.ac.nz/uoa/home/about/ourprogrammesandcourses*

Our Masters degree Brochure *https://cdn.auckland.ac.nz/assets/engineering/for/future-postgraduates/documents/Transportation_final_print.pdf*
Our Transportation Research Centre *www.trc.net.nz*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# The Changing Face of Transport in New Zealand

3–6 March . Wellington . Te Papa

## Mark your calendars now for the next Transportation Group conference!

### Networking events

We are working on delivering some quality networking opportunities while in Wellington.

We hope you can also join us at the gala dinner, on the Tuesday evening.

Details on the theme to be revealed in the coming weeks.

### Programme

We have had a great response to the call for abstracts.

The programme committee are piecing together an interesting and varied programme which will be published late October.

Keep an eye out for updates on the conference website.

### Special dates of interest

- Programme released **late October**.
- Papers written and submitted for peer review **2 November.**
- Registration opens **December**.
- Early bird registrations close **18 Jan.**
- Applications for young professional & student registrations close **18 Jan.**
- Conference **3-6 March 2019.**

Transportation Group New Zealand Conference 2019

TRANSPORTATION GROUP NEW ZEALAND

### CONFERENCE SPONSORS


We are calling for conference partners!

The sponsorship prospectus is out now for your perusal on the conference website.

# The Road to Zero

***Auckland Transport's Chief Executive Officer, Shane Ellison, outlines his vision for the Road to Zero.***

Our city is facing a road safety crisis.

Last year, 64 people died and 749 others were seriously injured due to road trauma. While road trauma statistics were improving between the 1980s and 2012, the trend is reversing.

Last year alone, the rate of deaths and serious injuries rose five times faster than the increase in Auckland's traffic. If this continues, it is the equivalent of a Pike River Mine disaster occurring every year. To me, this is simply unacceptable.

**Why is road trauma increasing?**

Evidence shows we are driving faster, we are more distracted and many of us have stopped wearing seat belts. We are also taking more risks at intersections, running red lights and driving 4km to 8km over speed limits. What we do not realise is that driving over the speed limit by just 4 km automatically corresponds to a 16% increase in deaths.

We have to step up, alongside our road safety partners, and respond to this crisis. The government, in its Government Policy Statement (GPS) on transport has made improving road safety a priority. We are aligning ourselves to meet this objective not simply because we are obligated to, but because it is the right thing to do.

**What is Vision Zero?**

Vision Zero is based on a principle that human life and health can never be traded for other benefits, such as journey travel times.

We have to commit to becoming a Vision Zero organisation that puts safety at the heart of our business, where our transport ecosystem is safe for all users of our roads. Faster journey times will no longer be our predominant success metric.

Vision Zero, also known as the Safe System, is an international road safety movement started in Sweden more than 20 years ago to eliminate all road deaths. Back then, Sweden had a similar fatality rate to New Zealand's today.

But they adopted ambitious targets, investing heavily in safety infrastructure and lower speed limits which resulted in almost halving road deaths by 2016.

If New Zealand had the same rate of road deaths per head, as Sweden today, 255 lives would not have been lost last year.

Across the Atlantic, New York adopted Vision Zero in 2014 and introduced a number of road safety measures, including lowering speeds on most roads to 40km/h. Last year, it recorded the lowest number of road deaths since officials began keeping statistics in 1910.

Change like this does not happen easily or quickly. Vision Zero challenges us to stop accepting road trauma as an inevitable unpleasant fact that must be endured; a price we have to pay for getting around. It requires a paradigm shift in the way we think and operate.


**The road to zero**
We have responded quickly to address the crisis on our roads.

In FY2017-18, we invested $3.4 million to address high-risk rural intersections, correct road shapes and install barriers. An additional $700,000 was invested on improving risky rural routes, improving signs, lining and road surfaces.

We signalised what were once one of Auckland's worst intersections at Bullock Track, Great North Road and Tuarangi Road (Western Springs) and Tāmaki Drive–Ngapipi Road (Mission Bay) to improve road safety for everyone. In the last four months, with the support of our Board, we have been working with our central government road safety partners and they are embracing the challenge we all have.

Our partners NZ Police have fully staffed their traffic safety team to bolster enforcement, the Ministry of Transport is exploring making implementation of speed management measures more streamlined, and the New Zealand Transport Agency is working with us to implement trials such as point-to-point speed cameras.

One of the most visible activities we have done in collaboration with partners was the Compulsory Breath Testing initiative with the Vodafone Warriors and NZ Police in South Auckland.

Looking ahead, I am committed to achieving 60% less deaths and serious injuries by 2028, as an interim target to get us to zero. Our $700 million Road Safety 2018-28 programme is designed to deliver major, minor and mass action safety engineering projects at high-risk locations across the network.

The Government, Auckland Council and proceeds from the Regional Fuel Tax will fund the road safety programme.

Recently, AT Board Chair, Lester Levy and I presented to the Auckland Council Planning Committee on our road to zero vision. We received unanimous support from the Councillors who have asked us to accelerate our road safety programme to make Auckland a Vision Zero region.

We are also working with NZ Police to begin installing 42 red light cameras across Auckland over the next 10 years. By October 2018, six will be operational at high-risk intersections to reduce dangerous driving. This will bring the total number of red light cameras operating in the region to 12.

We also are looking at a major change to the Schedule of Speed Limits by changing the bylaw, to allow us to set safe and appropriate speeds across the region.

Other solutions like speed calming measures (speed humps and raised intersections) will be used at high-risk residential areas and town centres.

**Why aim for zero?**
Vision Zero is aspirational.

International research shows that cities with bold visions backed by ambitious targets have achieved the greatest road safety outcomes. Without a bold vision, we can be captive to traditional thinking and methodologies that lead to only minor improvements in the status quo.

Achieving zero deaths and serious injuries is a challenge for all of us – from policy makers, system designers, operations, construction and road maintenance teams.

We have to be more innovative and deliver solutions where the safety of all road users is the primary goal. We need to consider more than just where to construct a bus stop, but to factor in how we can get people safely to and from it.

It is about incorporating elements of the Safe System into our routine maintenance. We need to ensure our partners and consultants design our projects to deliver infrastructure that protects everyone. A simple driving error, or someone crossing a road while distracted, should not lead to death or serious injury.

This means we have to do more than just business as usual or tweaking of what we have always done. We need to trial innovative solutions, be agile in response to our customers' demand for safety and work closer with our partners.

Because, what is at stake is the happiness and welfare of our friends and whānau, and our fellow Aucklanders.

I encourage each of you to start thinking about how we can achieve our Vision Zero goals, so that none of our friends or whānau get horrifying news of loved ones being hospitalised, or losing them forever due to road trauma.


# "Are we there yet?"

## Opinion piece: Emma McInnes, MRCagney

I'm often still really shocked by some of the attitudes against diversifying the workforce in our urban industries.

In July 2018, Manglin Pillay, CEO of the South African Institution of Civil Engineering published this disturbing piece of writing, that clearly demonstrates why we need more women in our urban industries (the link to the article has now been removed).

It's titled: "Out on a rib."

To be honest it took me a while to get this, until another Women in Urbanism member kindly informed me that it was an antagonistic title, a biblical reference to the 'rib' that Eve was made from. Fury and queasiness ensued.

Pillay suggests there shouldn't be funding to encourage women into male dominated STEM industries. Because according to a paper published by Leeds Beckett University, women prefer "people-oriented careers". Where as the men, well they prefer "things" and "mechanics."

Plus women all want to be caregivers anyway.

Why is this relevant in a New Zealand context? Because one of Women in Urbanism's biggest problems is that plenty of city builders in Aotearoa don't believe Women in Urbanism is needed.

We still see eyes rolling into the back of heads while we do the emotional labour of elevator pitching, and talking about issues we really wish weren't issues. And the snide remarks like "why isn't there a men in urbanism group?" always find their way back to us.

These are the same people who believe they are practicing inclusive design, and that their designs could not be improved by more women. They don't agree that a woman's perspective is needed in the work of city building. So then, why is it our city design is still so shit?

Why do we still have to put up with places, spaces and transport networks that make us feel unsafe and unwelcome. Here's the thing: you cannot claim to value diversity and be designing to meet the needs of all users, if you don't value diversity around your decision making tables.

***You cannot claim to value diversity and be designing to meet the needs of all users, if you don't value diversity around your decision making tables.***

Back to Pillay, who actually spews this onto the page: "the fact that more men occupy high profile executive posts is not because of gender but because of appetite for workload and extreme performance requirements."

Pillay, clearly struggling with verbal diarrhea, also goes on to dig this hole for himself:

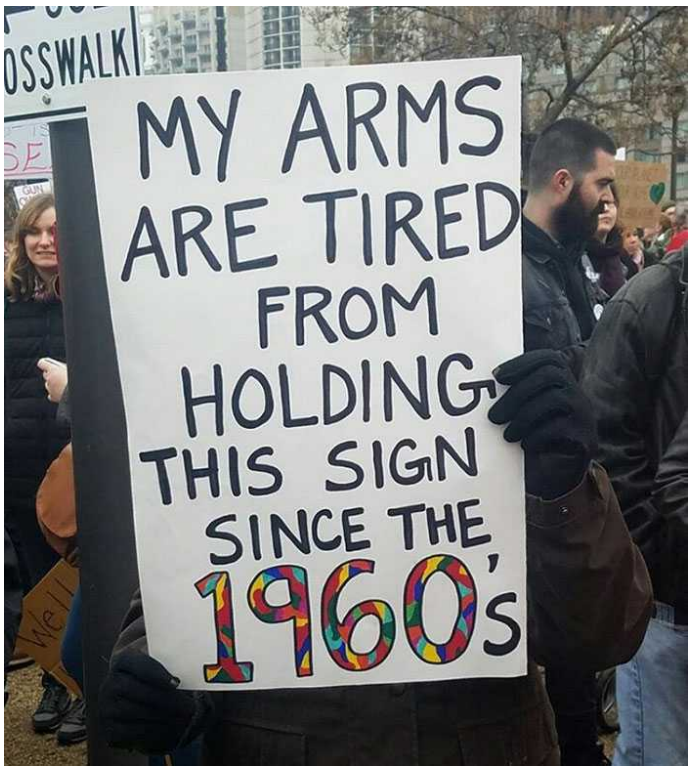
"But here's the conundrum - given that money, time and resources are constrained, and evidence pointing to women being predisposed to caring and people careers, should we be investing so heavily in attracting women into STEM careers, specifically engineering, or should we invest in creating more gender-equal societies?"

Pillay directly contradicts himself, for how does a gender-equal society come in to being, if women aren't involved in industries across the board?

In the recent Auckland Museum exhibition titled 'Are we there yet?' there is a photo of a woman holding a placard that reads 'I can't believe we still have to protest this shit'.

'Are we there yet?' is a great question. With so many seriously misguided people in leadership positions, who are predominantly older, male and white, it's more than worthy of a conversation.

Women and men are both equally important and hold equal worth, but currently infrastructure funding benefits men more than it does women.




Cities are designed largely by men, for men. Our built environment is sexist. Top CEOs in our industry don't think women should be learning about engineering.

Women's pay is less (which has more to do with unconscious bias than it does women's negotiating capability). Women's experience of our transport systems are secondary to men's (women walk more than men, and men drive more than women. We have a perfect roading network, and a shit walking network. Women also cycle less in cities where there is no infrastructure). We have a long way to go to build an equitable urban environment.

The industry stats are bleak in Aotearoa too. There's a serious lack of women in New Zealand's urban industries at all levels. Only 15% of Mayors and 20% of District Mayors in Aotearoa are women.

In the profession of Architecture, women make up 29% of the industry, 17% in Construction, and just 14% of Engineers are women. There are even fewer Māori, Pasifika and Asian women and men in these industries.

We're not the only ones appalled by Pillay, and the state of our urban industries. Ferdi Nell from Aurecon, penned an open letter to Pillay, asking Pillay to apologise to the women of South Africa:

*"We believe the article published under your organisation's name is extremely damaging to our reputation as engineers and is also insensitive to the ongoing challenges that women engineers face. The article stereotypes women by presenting them as soft and caring, yet ultimately ill-suited for roles that are technically and managerially demanding.*

*It also stereotypes men who by implication are presented as less caring and less suitable for parenting or people-oriented careers. It justifies unequal pay, despite codes and legislation prohibiting discriminatory practices in the workplace.*

*It even stereotypes industry leaders as disagreeable, power hungry and friendless A-types…We believe no single organisation can drive real change alone. We need to combine our efforts to eradicate gender discrimination within the engineering industry and continue to encourage others to do the same."*

We need diversity across the board in our city building industries so we can make fair, representative, equitable and appropriate decisions that will ultimately benefit everyone.

I love that Pillay reckons us women prefer 'people-orientated careers,' whereas men like 'things' and 'mechanics.' It's sort of an accidental confession from Pillay that male engineers don't consider the people they're designing for.

We know city design needs to consider the needs of people first. And Pillay does say that women prefer "people-oriented careers".

***He reckons women prefer 'people-orientated careers,' whereas men like 'things' and 'mechanics.' It's sort of an accidental confession that male engineers don't consider the people they're designing for.***

We have a long way to go, it's true, until society recognises that if women are truly better off in more "people-orientated careers," then they're perfect for the jobs in our urban industries. Especially Pillay's job.

*Post-script: Pillay has now stepped down and his article has been removed.*

For more info, go to:
www.womeninurbanism.org.nz

# Intelligent Transportation Engineering: What is Needed?

Winner: Highly Commended Paper at 2018 Transportation Group conference

*Alan Nicholson*
*Emeritus Professor,*
*University of Canterbury*

Currently, there is rapidly growing interest in innovative technologies to improve our transportation systems, including:
• advanced traffic management technology (e.g. real-time traffic management);
• advanced vehicle technology (e.g. autonomous vehicles).

These technologies are being promoted by technology suppliers and advocacy groups (e.g. the Intelligent Transportation Society of America, established in 1991 with the goal "to save lives, time and money and sustain the environment, through broad deployment of interoperable ITS technologies").

The reputation of engineers as good 'problem solvers' is based largely on their ability to solve existing problems, which are generally well-recognised and well-defined. Solving these can require considerable intelligence, but greater intelligence is needed to solve existing problems without creating other problems.

For instance, in the late 1800s, an existing problem in large cities all around the world was horse manure. London had over 50,000 horses for people transport (excluding horse-drawn goods transport) and New York had about 100,000 horses for transport. Each horse produced 7-16 kg of manure and about one litre of urine per day, and it was estimated that in 50 years horse manure on London streets would be about 2.75 m deep. The automobile was seen as solving that problem.

However, horse manure was not the only problem. In the late 1870's (i.e. pre-automobiles), about 240 people were killed and about 3200 injured each year on London streets (Hobbs, 1974). The population of London at that time was about 4.5 million, so there were about 53 deaths per million inhabitants. In 2010-2014, there were about 1800 road deaths/year in the whole of the UK (Department for Transport, 2016a). With the UK population being about 65 million in 2012, there were about 28 deaths per million inhabitants.

While safety has improved since the introduction of automobiles, the elimination of horse manure on roads has resulted in greatly increased greenhouse gas emissions.

Intelligent transportation engineering involves much more than simply adopting the latest technology. It involves the following steps:
• clearly identify the objective;
• identify the options with a good level of potential for achieving the objective;
• appraise those options thoroughly (including anticipating future problems);
• select and implement the best option;
• recognise the uncertainty and potential for 'optimism bias' in appraisal, and evaluate the implemented option.

The NZ Transport Strategy (Ministry of Transport, 2008) specified a vision ("an affordable, integrated, safe, responsive and sustainable transport system for people and freight") and five key objectives:
• ensuring environmental sustainability;
• assisting economic development;
• assisting safety and personal security;
• improving access and mobility;
• protecting and promoting public health.
The UK had five very similar objectives (Department for Transport, 2009).

A recent report (Ministry for the Environment & Statistics NZ, 2017) notes that the two largest sources of greenhouse gas (GHG) emissions in NZ in 2015 were the digestion of animals and road transport, with about 28.1 Mt and 13.3 Mt of CO2-e per year, respectively. However, the growth in transport emissions (78% since 1990, or about 5.20% per year) is very much larger than the growth in animal digestion emissions (5% since 1990, or about 0.33% per year).

If these growth trends continue, road transport emissions will exceed animal digestion emissions in about 24 years. Clearly, the sustainability of transport, especially road transport, which accounted for 90% of domestic transport GHG emissions in 2015 (Ministry for the Environment, 2017), is a problem that urgently needs to be addressed in NZ.

After about 10 years of fairly steady improvement in road safety, there has been a fairly steady deterioration, with distinct upward trends in both deaths and injuries associated with road crashes, since the end of 2014 (Ministry of Transport, 2017), and road safety remains a problem which also needs addressing in NZ.

In recent years, there has been a strong focus on autonomous vehicles (AVs) as the solution to existing transport problems, particularly those related to safety and sustainability. This paper will review recent research on the effects of AVs (private and shared) on safety and sustainability. It will also review recent research on the effects of AVs on road network performance, urban form and travel behaviour, and will discuss legal liability issues (civil and criminal) and ethical issues.

The Society of Automotive Engineers (SAE) defined three types of driving tasks (Society of Automotive Engineers, 2014):
- operational (steering, braking, accelerating, monitoring vehicle and roadway);
- tactical (responding to events, determining when to change lanes, turn, use signals, etc.);
- strategic (determining destinations and waypoints).

The first two tasks constitute the dynamic driving task (DDT), and this has been the focus of automation efforts to date.

The SAE also defined 'driving mode' to mean a driving scenario with characteristic DDT requirements (e.g. expressway merging, high speed cruising, low speed traffic jam, etc.), and a request to intervene (RTI) as a notification by the automated driving system (ADS) to the human driver/supervisor to promptly begin or resume performance of the DDT.

The SAE has defined six levels of automation:
- Level 0 (no automation): driver performs 100% of DDT full-time (with warning or intervention systems);
- Level 1 (driver assistance): driver monitors and ADS assists driver with other tasks for some modes;
- Level 2 (partial automation): driver monitors, ADS performs other tasks for some modes.
- Level 3 (conditional automation): ADS performs 100% of DDT part-time for some modes;
- Level 4 (high automation): ADS performs 100% of DDT full-time for some modes;
- Level 5 (full automation): ADS performs 100% of DDT full-time for all modes.

Note that if the ADS is unable to cope and it makes an RTI to the driver/supervisor, this might mean that legal liability for a crash shifts from the vehicle/ADS supplier to the driver/supervisor. This issue is discussed later.

The UK has adopted a four-level system (Department for Transport, 2016b):
- Level I (No automation)
- Level II (Driver assistance)
- Level III (Partial → High automation)
- Level IV (Full automation)

Note that SAE levels 2 – 4 have been merged into one level (Level III).

There are several stages in the development of any technology, and the maturity of technology can be assessed using nine 'technology readiness' levels (Department of Defense, 2011):
1. basic principles observed and reported;
2. technology concept and/or application formulated;
3. analytical and experimental critical function and/or characteristic proof of concept;
4. component and/or breadboard validation in laboratory environment;
5. component and/or breadboard validation in relevant environment;
6. system/subsystem model or prototype demonstration in a relevant environment;
7. system prototype demonstration in an operational environment;
8. actual system completed and qualified through test and demonstration;
9. actual system proven through successful mission operations.

It would appear that AV technology readiness is no further than the early stages of the sixth level.

These 'technology readiness' levels are very technical in nature, but there is a considerable amount of 'hype' involved in the development of AVs, as with many other technology developments. This is reflected in the 'Gartner technology life-cycle' (Fenn and Raskino, 2008), which involves five distinct and important phases in the development and implementation of technological innovations (see Figure 1). They are:
1. technology trigger (i.e. a potential technology breakthrough occurs, early proof-of-concept stories are publicised, and a few usable products exist, but commercial viability is unproven);
2. peak of inflated expectations (i.e. much publicity of successes but not failures, and some companies take action but most don't);
3. trough of disillusionment (i.e. interest wanes as applications and producers fail, and investments continue only if surviving producers improve the product and satisfy early adopters);
4. slope of enlightenment (i.e. the merits of the technology become more widely understood, second and third generation products appear, and more enterprising businesses fund pilots);
5. plateau of productivity (i.e. mainstream adoption starts to take off, and the technology's broad market applicability and relevance become clear).

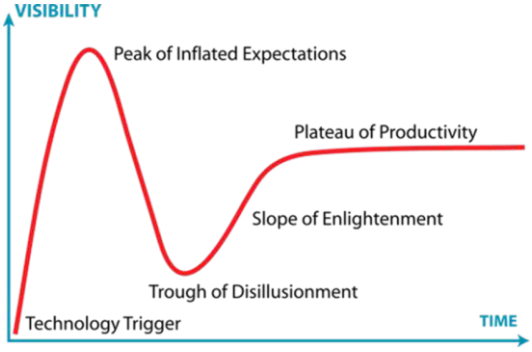



*Figure 1: The Gartner Technology Life Cycle*

Examples of innovative transport technologies that have failed before achieving the final stage include the 'Cyclomer' amphibious bicycle (1932), the 'Amphicar' amphibious automobile (1961), the General Motors 'Firebird IV' (1964), Gibbs' 'Aquada' (2004), Hemmatnia's boat-bike (2015), and the Chinese 'elevated bus' (2016).

Another example is the 'helicopter coupe', which was announced and promoted as follows (Stimson, 1951): "Do you want a helicopter that's small enough to land on your lawn and big enough to carry two people? A simple, practical, foolproof machine? It's in production." Stimson's article was accompanied by a picture (Figure 2), which promotes the 'helicopter coupe' as a viable replacement for the car for commuting to/from work. The advertising for the 'helicopter coupe' involved an element of 'hype', to get the public excited about the new technology and stimulate interest in acquiring and using it.

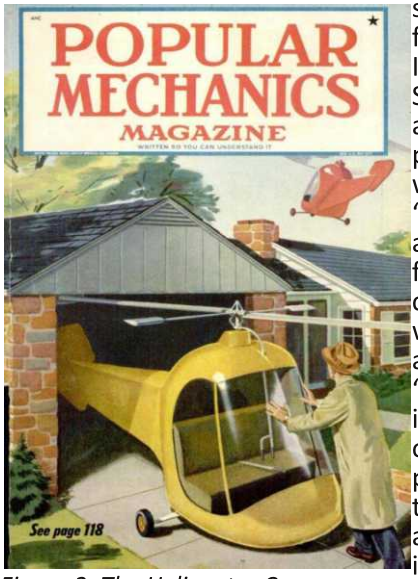


*Figure 2: The Helicopter Coupe*

There was a more substantial element of 'hype' in relation to General Motors' Firebird IV (Figure 3), which debuted at the 1964 New York World's Fair, and was promoted as a car which would be controlled by automatic programmed guidance systems rather than a human driver and would ensure absolute safety at a speed more than twice the speed possible on expressways in 1964. The Firebird IV, like the helicopter coupe, failed very early in the technology life cycle.


*Figure 3: The GM Firebird IV*

There is an even more substantial level of 'hype' in the recent proposal from Uber (Holden and Goel, 2016) for a network of small, electric vertical take-off and landing (VTOL) aircraft, that will enable rapid, reliable on-demand transport, and will be more affordable than transport by car (Figure 4).


*Figure 4: Uber's Flying Cars*

It appears that 'hype' is not confined to the promotion of vehicle technology. For example, Frost (2017) has reported that Siemens has introduced new traffic control software for connected intersections, "… software that allows controllers located at intersections to share information with one another ... allows the on-street network of controllers to adaptively respond to changing traffic conditions in real time … controller can transmit information about a large number of vehicles to a controller at the next traffic signal … allows extra green-light time for the group of cars to move through multiple intersections …". How does this differ from an Area Traffic Control System such as those implemented in some countries in the 1970's?

It is interesting to see that the 2017 Gartner hype cycle shows the autonomous vehicle as having passed the peak of inflated expectations and as heading into the trough of disillusionment (Gartner, 2017).

The safety of vehicles negotiating horizontal curves has been an issue for many years, because of the centrifugal force on the car and its driver when a car is driven around a curve. This led to the development of tilting cars, which have the ability to change the angle between the road and the car's chassis. This results in a higher proportion of that centrifugal force acting along the 'axis' of the driver (a compressive force) and a smaller proportion acting parallel to the surface of the road and causing body sway.

Humans are more 'sensitive' to a force causing body sway than to forces along the 'axis' of the body. Having a tilting vehicle would thus reduce the force which makes drivers less comfortable and which might help drivers sense that they should reduce speed, so they are less likely to reduce speed.

However, having a tilting vehicle does not affect the forces on the vehicle itself (i.e. the gravitational force and frictional force between the tyres and the road surface). Whether the vehicle slides towards the outside of the curve depends upon the maximum available frictional force. Hence, the tilting of the vehicle increases the likelihood of drivers not reducing speed sufficiently and consequently calling upon more friction than is available (i.e. it increases the likelihood of an accident).

Since 2014, Mercedes S-class vehicles have had automatic tilting mechanisms, with the maximum tilt being about 2.5 degrees, which is (fortunately) quite small and is unlikely to result in serious problems, especially given the overall quality of such vehicles. Nevertheless, the interest in developing tilting cars is a classic case of technology being developed without proper consideration of fundamental mechanics and human factors.

During the early 1990s, it was proposed to use 'in-vehicle speed adaptation' (ISA) to manage speeds and improve road safety by reducing the probability and severity of crashes. Trials of ISA were undertaken in some countries, including Sweden and the Netherlands. The Lund trial (Hjälmdahl, 2004) involved speed limit 'reminders' for drivers and fitting cars with an 'active accelerator pedal' (AAP), which applied a resistance to the accelerator pedal if the speed limit was exceeded (acceleration was still possible, by pressing very hard on the accelerator pedal), making it impossible to exceed the speed limit inadvertently.

The aim of the trial was to assess the effectiveness and acceptability (to drivers) of the system. Based on observed changes in speed, Hjälmdahl (2004) estimated that ISA would give reductions of up to 25% and 32% in injury and fatal crashes respectively, and noted that driver acceptability decreased as the intrusiveness increased (e.g. people who drive fast and have a high accident involvement were less accepting). Hjälmdahl noted "there is a clear case for implementing ISA, but there is still nowhere you can buy such a system" (vehicle manufacturers were not interested, perhaps because they perceived that ISA would not assist with sales of their products).

It is worth noting that alcohol and seat-belt 'interlocks' have been available for over 20 years, but have also not been widely adopted.

It is well known that as traffic density increases, the traffic flow on a link becomes less stable, with 'shock waves' being generated and travelling upstream, causing a reduction in both the flow rate and speed of traffic. The interest in automated driving systems to avoid the occurrence of shock waves is not new, as evidenced by the PATH (Partners for Advanced Transit and Highways) program, established in c.1988 by the Institute of Transportation Studies (University of California, Berkeley) and the California Department of Transportation, to undertake research on an 'automated highway system' (Anon. 1994; Anon. 1997; Anon. 1998).

In mid-1997, the researchers demonstrated a stream of eight cars (with V2V communication and radar sensors) travelling along a freeway lane at 96 km/h while only 6.4 m apart (giving a capacity of c.4400 cars/hour/lane). They also achieved 112 km/h with vehicles only 3.7 m separation.

A recent theoretical study (Talebpour and Mahmassani, 2016) investigated the effect of AVs on flow stability, and found that it improves as the proportion of connected (V2V and V2I) AVs increases. A more recent experimental study (Stern et al., 2017) found that it is not necessary for all vehicles to be connected and autonomous for flow instability to be greatly reduced; they found that flow instability in dense traffic is greatly reduced with only 5% of non-connected AVs.

More link flow stability means less congestion delay, and Fagnant and Kockelman (2013) estimated that congestion delay would decrease by 60% for freeway links and 15% for arterial links, with a "near doubling" of freeway link capacity (consistent with the PATH project results). However, network capacity is generally governed by node (or junction) capacity, so it is important to also consider junction performance with AVs.

It is known that car passengers experience discomfort at lower rates of acceleration than do car drivers, and all AV occupants are likely to expect lower acceleration rates than car drivers, so they can do 'other tasks' while travelling. Le Vine et al. (2015) used microsimulation (VISSIM), along with maximum acceleration rates appropriate for rail, and found signalized junction delay was greater for AVs than for driver-controlled vehicles.

Junction capacity and delay are sensitive to increases in critical gap and follow-on gap values, and lower acceptable accelerations means higher values of these gap acceptance parameters (especially the critical gap), giving lower capacity and higher delay at junctions. In addition, junctions are more 'complex' than links, and Gomes (2014) has suggested that AVs might therefore be programmed particularly cautiously for junctions, further decreasing capacity and increasing delay.

Estimates of the change in veh-km of travel with AVs vary widely (Harper et al., 2016), depending upon the sources of the change, e.g.

- +10% to +20% (per AV) ~ due to induced demand;
- +75% (per AV) ~ due to reduced household car ownership;
- +14% to +40% (upper bounds) ~ due to more vehicular travel by the youth, disabled, and elderly;
- -35% to +20% ~ due to reduced travel times, operating and parking costs.

A study (International Transport Forum, 2015) used an agent-based model to assess the impact of the large-scale uptake of 'shared autonomous vehicles' in the Lisbon Metropolitan Area, which has:

- 2.8 million inhabitants spread over an area of about 3000 km2, with 0.61 million cars (only 0.217 cars/person);
- 5 million person-trips/day: 60% by car, 14% by bus, 11% by rail, 8% by bus+rail, 4% by car+rail, and 4% by 'other';
- 0.20 million parking spaces in the central city (only 0.33 spaces/car), with 75% on-street and 25% off-street.

The study considered two types of 'shared autonomous vehicles':

- autonomous cars, shared sequentially by single passengers ('AutoVots'), i.e. car sharing;
- autonomous cars, shared simultaneously by several passengers ('TaxiBots'), i.e. car and ride sharing.

Modelling assumed TaxiBots and AutoVots would deliver the same number of trips (with the same origins, destinations and start times as currently) and would replace all car and bus trips.

The results (Table 1) reveal that:

- the impacts are better if there is a rail service, especially for veh-km of travel;
- the impacts are better for TaxiBots than for AutoVots, except for travel times and waiting times;
- there is a large increase in veh-km of travel, especially for AutoVots and especially without a rail service.

| Impact | AutoVots | | TaxiBots | |
|---|---|---|---|---|
| | (with rail) | (without rail) | (with rail) | (without rail) |
| Change in cars needed | -83% | -77% | -90% | -87% |
| Change in travel (veh-km) | +44% | +89% | +6% | +22% |
| Change in peak flows | -43% | -33% | -65% | -57% |
| Change in parking demand | -89% | -84% | -95% | -93% |
| Change in travel times | -38% | -38% | -13% | -17% |
| Change in waiting times | -89% | -86% | -86% | -86% |

*Table 1: Impacts of Shared Autonomous Vehicles (Lisbon)*

The Lisbon study did not identify the environmental impacts (e.g. GHG emissions), but it was suggested that the increase in veh-km would be off-set by reduced emissions per veh-km. However, a study of shared autonomous vehicles (Fagnant and Kockelman, 2014)

(Article continues)

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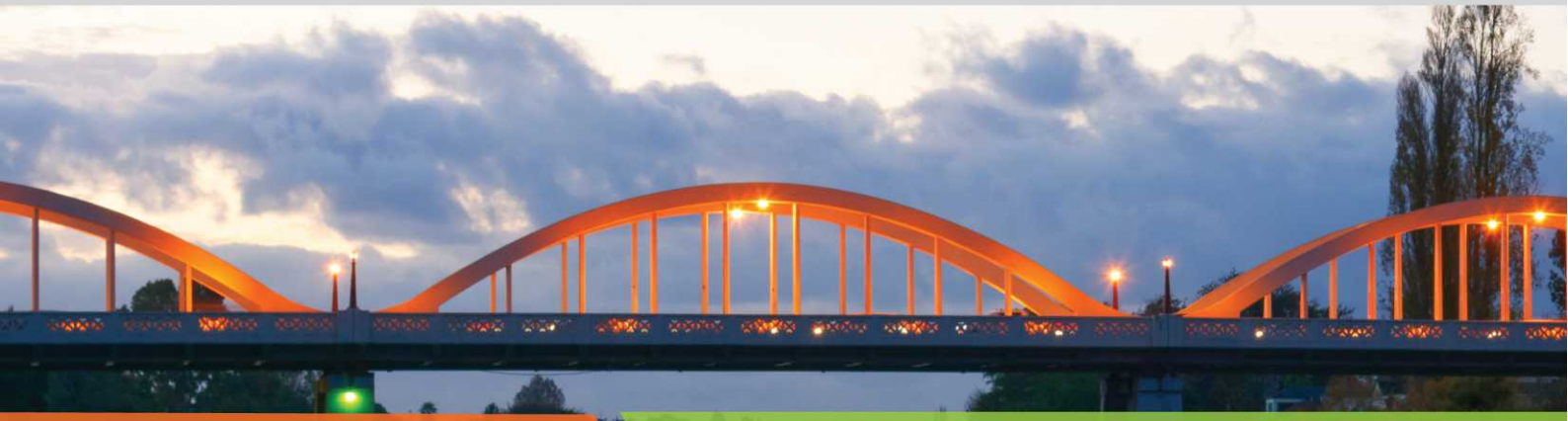

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suggested that while there would be an 11% increase in veh-km of travel, there would be a 12% decrease in energy use and a 6% decrease in GHG emissions.

Both these studies assumed that travel demand would not change (i.e. there would be no increase in trip number and trip length). That is, both studies ignored how people would respond to a decrease in travel costs (time plus vehicle operating costs); there is much evidence that people make more and/or longer trips as costs decrease. Road pricing could be used to limit the increase in veh-km, but road pricing is not attractive to the public and politicians. However, climate change goals (a reduction in greenhouse gas emissions) will not be achieved unless the increase in veh-km is limited.

Thakur et al. (2016) suggest AVs will result in longer trip distances, higher veh-km and urban sprawl, due to a lower value of travel time (more scope for other activities while travelling) and higher trip speeds. They also note that if AVs are shared, the value of travel time will not decrease, as the scope for other activities will be less, and they suggest the effect of sharing (a higher travel time value) might out-weigh effect of lower travel time values with AVs (i.e. veh-km might reduce).

The uptake of AVs will depend upon their affordability or people's willingness-to-pay (WTP). Kyriakidis et al. (2015) surveyed 5000 people in 109 countries, finding that 5% are willing to pay >US$30,000 extra, but 22% are not willing to pay any extra (over the purchase price of a non-autonomous car). They found that WTP is higher for males than females, and WTP increases with income and distance driven. They also found that respondents are most concerned about security (software hacking/misuse), plus legal issues and safety.

A survey of 260 Australasians (Ellis et al. 2016) found that the average WTP is about US$5000 (i.e. about 20% more than non-autonomous car), people aged <36 and 36-60 are respectively 1.4 and 1.2 times more likely to use an AV than people >60, males are about 1.1 times more likely to use an AV than females, and the main attraction of AVs appears to be greater safety, followed by travel time savings.

Haboucha et al. (2017) surveyed 721 people and used choice models to explain the preferences for private-non-autonomous/private-autonomous/shared-autonomous vehicles. They found that 44% prefer private-non-autonomous, a pro-AV attitude has similarly strong positive effects on choosing private and shared AVs, enjoyment of driving has a strong positive effect on choosing private-non-autonomous vehicles, and concern for the environment has a strong positive effect on choosing shared-AVs.

Daziano et al. (2017) also used choice models to assess AV demand, and found that the mean WTP for partial automation is US$3500, the mean WTP for full automation is US$4900, and the WTP varies widely, with demand for automation being split approximately evenly between high, modest and no demand.

Koopman and Wagner (2017) argue that a coordinated, inter-disciplinary approach, addressing nine areas (computing hardware, software, robotics, testing, security, human-computer interaction, social acceptance, legal issues and safety engineering) will be needed to meet the requirements of ISO 26262: Road Vehicles – Functional Safety (International Organization for Standardization, 2011). They argue that meeting the requirements of ISO 26262 will be a major challenge.

In-depth investigations (Sabey and Staughton, 1975; Treat, 1980; Sabey, 1983) have found that c.90% of road accidents involve human error, and many advocates of autonomous vehicles (AVs) suggest accidents will be reduced by c.90%. For example, Fagnant and Kockelman (2013) state that "driver error is believed to be the main reason behind over 90 percent of all crashes" (emphasis added), and they overlook the fact that accidents typically involve more than one type of factor (road environment factors and vehicle factors are typically involved in c.30% and c.10% respectively). Eliminating the 'main' factor might well not prevent the crash.

It is not clear how AV's will recognise and cope with deficiencies in the road environment, such as warning signs being too close to the hazard, inappropriate warning signs, non-standard temporary traffic management arrangements at roadworks, localised reductions in superelevation at curves, road surface deficiencies (e.g. potholes), and worn pavement markings.

Human factors researchers are particularly concerned about the transition of control (i.e. the switch from highly automated driving to manual driving while in traffic), which will be needed unless the ADS can master all possible traffic situations and all weather conditions, and will never fail. There are two types of transition of control (Vlakveld, 2015):

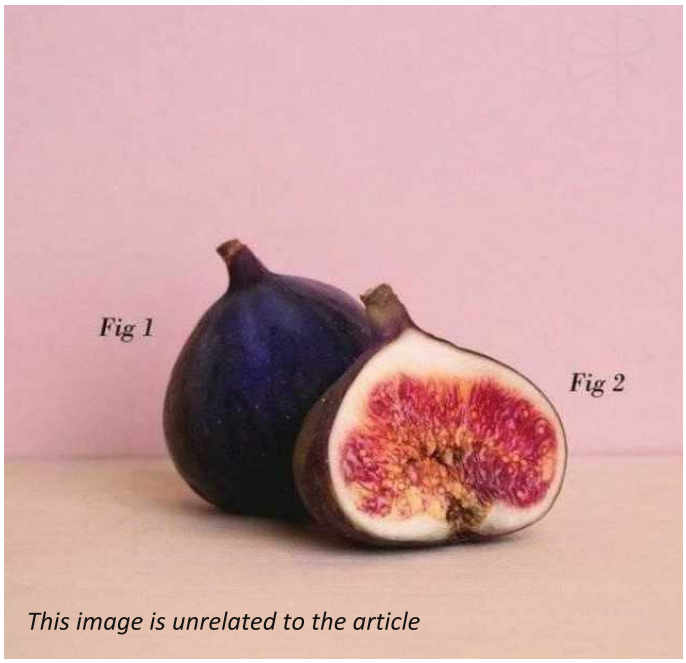
- planned (e.g. driver takes control when leaving motorway) ~ driver actions are initially slow and error-prone;
- acute (i.e. driver takes control when ADS fails or cannot cope) ~ the driver is probably incapable of avoiding the impending crash, due to lack of situation awareness.

Banks et al. (2018) note that the human factors literature indicates that humans are notoriously inefficient at completing prolonged monitoring tasks. They undertook observations of on-road driver behaviour with a partially automated vehicle (a Tesla Model S operated in Autopilot mode), which requires drivers/supervisors to remain in an active monitoring state, ready to resume manual control if required. They concluded that drivers are not being properly supported in adhering to their new monitoring responsibilities and instead demonstrate behaviour indicative of complacency and over-trust. They suggested that these attributes may encourage drivers to take more risks whilst out on the road.

Developers and testers of AV technology are trying to prove the safety of the technology via on-road use. For example, Blanco et al. (2016) studied Google AV safety based on 1.3 million veh-miles in autonomous mode; they found the crash rate was 8.7 per million veh-miles, which is about 40% higher than the USA national mean of 6.1 per million veh-miles (both reported and unreported crashes). However, they found insufficient autonomously driven miles to identify a statistically significant difference between the AV and non-AV crash rates.

Kalra and Paddock (2016) investigated how much AV road use is needed for statistical significance that the AV fatal crash rate is less than the mean fatal crash rate of human drivers in the USA (1.09 fatalities per 100 million miles), and found that at least 275 x 106 veh-miles of AV use would be needed for 95% confidence. To achieve this, at least 100 AVs being driven 24 hours/day for 365 days/year at 25 miles/hr for 12.5 years would be necessary. It should be noted that the minimum veh-km of fatality-free use increases as the mean fatal crash rate of human drivers decreases (the rate is lower in some countries than in USA) and the desired level of confidence increases.

Kalra and Paddock also show that if the true fatality rate for AVs is 20% lower than that for human drivers, then almost 5 billion miles of AV use is needed for statistical significance at the 95% confidence level. This would entail 100 AVs being driven 24 hours/day for 365 days/year at 25 miles/hour for 225 years.



*This image is unrelated to the article*

Kalra and Paddock conclude that it will take many millions of miles of driving to statistically verify the safety benefits of AVs and that it is impossible to demonstrate AV safety is significantly better than human driver safety prior to releasing AVs for general use. They conclude that "this poses significant liability and regulatory challenges for policy-makers, insurers and developers of the technology … a cause for concern among the public".

Of particular concern is the risk to cyclists and pedestrians resulting from collisions with AVs. It is interesting to note that in 12 November 2014, Google applied for a US patent for "a system for protecting a colliding object from a secondary impact, after an initial impact with a vehicle … an adhesive layer positioned on the front end of the vehicle, a coating positioned over the adhesive layer … upon the initial impact … the coating is broken exposing the adhesive layer to adhere the colliding object to the adhesive layer." A US patent was granted on 17 May 2016 (US Patent and Trademarks Office, 2016). Google's action appears to indicate some doubt regarding the ability of their AVs to detect pedestrians and cyclists, and avoid colliding with them.

Technology will occasionally malfunction, as evidenced by crash investigations having shown that vehicle factors alone contribute to 2%-3% of crashes, plus another 3%-9% in conjunction with user and/or road factors (Sabey and Staughton, 1975; Treat, 1980; Sabey, 1983). As noted below, AVs have been observed violating red-lights.

There are two types of liability (Leiman and Bilsborow, 2016):
• civil liability for loss or harm due to malfunctions arising from a breach of duty of care;
• criminal liability where there is loss or harm arising from an intentional act (e.g. careless or dangerous driving).
One might be able to get insurance for the first but not the second.

In NZ, the Accident Compensation Corporation covers the costs associated with injuries resulting from road crashes, but it does not cover the vehicle repair costs, which can be large if large modern trucks are involved. Insurance companies have been known to seek to recover vehicle repair costs from individuals whose behaviour results in large costs.

Strict liability entails imposing liability on one party without any finding of intent or failure of duty of care. Some AV suppliers have said they will accept this if the AV was in 'autonomous mode' (i.e. the driver has not intervened), but will they accept strict liability if/when large damages awards are made by Courts?

A critical issue is identifying the liability of the manufacturer and/or the driver/supervisor if either:
• a collision occurs after a driver/supervisor has resumed control without the automated driving system (ADS) having made a request to intervene (RTI);
- is it reasonable to expect drivers/supervisors not to intervene if a collision seems imminent and the ADS has not made an RTI and does not appear to be responding in such a manner that a collision will be avoided?
• a collision occurs after a driver/supervisor has resumed control, in response to the ADS having made an RTI;
- did the ADS make the RTI so late that it is not reasonable to expect the driver/supervisor to have been able to avoid the collision?

It should be noted that an AV crash at the International Driverless Cars Conference in Adelaide in Nov. 2016 was blamed on the driver for intervening without an RTI (Leiman and Bilsborow, 2016). Uber has tended to blame the driver/supervisor after crashes involving Uber AVs (Levin, 2016).

Sometimes there are faults with the road environment (e.g. inappropriate warning signs, warning signs not located appropriately, worn pavement markings). Determining and apportioning liability (between the driver, AV maker and road authority) is often very difficult, and will mean more work for lawyers and expert witnesses.

Sparrow and Howard (2017) argue that it is unethical to sell (or use) AVs if AVs are less safe and that it is unethical to drive traditional cars if AVs are more safe. However, they also note another ethical issue, which is the need to balance higher safety for 'poor' drivers (i.e.

those whose driving ability is worse than an AV) against lower safety for good drivers (i.e. those whose driving ability is better than an AV). While there might be a benefit to society as a whole, this might well be insufficient to justify imposing a greater risk on those good drivers.

Sparrow and Howard also refer to the tendency of drivers to rely excessively upon driver assistance and automated driving systems, stating that it takes 2−30 sec to regain situational awareness, depending upon driver alertness. They argue that AVs should monitor 'supervisors' continuously and should be programmed to slowly and safely park if the 'supervisor' is not sufficiently alert.

Consider the following scenario:
• a car is proceeding along a road with pedestrians on the footpaths alongside, when a pedestrian suddenly steps onto the road and into the path of the car;
• there are three options;
- proceeding straight ahead and perhaps killing/maiming that pedestrian;
- swerving and perhaps killing/maiming other pedestrians;
- swerving and perhaps hitting a pole injuring the car occupants?

Who should make the choice between the three options:
• should it be a human driver, who can assess the particular situation and the merits of the options?
• should it made a programmer producing AV software?

If the manufacturers of AVs are not going to be held strictly liable, then a judicial process will be required for determining the level of culpability of the driver/supervisor and the level of culpability of the software programmer(s). That will mean more work for lawyers and expert witnesses.

The dilemma arising in the above scenario has its roots in a classic philosophical 'thought experiment' known as the 'trolley problem' (Foot, 1967). This was introduced to illuminate the peculiar and sometimes surprising patterns of how humans distinguish between right and wrong.

Consider the case of a runaway trolley heading down a track towards five workers who will all be killed if the trolley proceeds on its present course. The only way to save the lives of the five workers is to divert the trolley onto another track that only has one worker on it. Is one justified in diverting the trolley to save five workers but kill one other worker?

Now consider the case of a runaway trolley heading down the track toward five workers who will all be killed if the trolley proceeds on its present course. There is bridge over the track, between the runaway trolley and the five workers. On the bridge is a stranger who happens to be very large, large enough to stop the trolley. If one is also on the bridge, is one justified in pushing the stranger off the bridge and onto the tracks below, if doing so will result in the death of the stranger but the salvation of the five workers?

The trolley problem highlights a fundamental tension between two schools of moral thought, the utilitarian and the deontological. The former favours the action that achieves the greatest good for the greatest number, while the latter asserts that killing an innocent person is wrong, even if they have good consequences.

*This and the article's lead photo are not actually images of autonomous car futures. They are photos from a recent taxi strike in Spain. But they look cool.*

In both versions of the trolley problem above, utilitarians say you should sacrifice one life to save five, while deontologists say you should not.

Cushman et al. (2006) surveyed thousands of people and found that while 89% would re-direct the trolley in the first case above (i.e. displayed utilitarian values), only about 11 percent would display utilitarian values by pushing the large stranger off the bridge. Cushman et al. argued that this inconsistency shows how emotions can affect ethical judgments. Such inconsistency will make it difficult to identify a socially acceptable method for dealing with such moral dilemmas.

There have been several instances of Uber AVs in California not stopping for red-lights (e.g. Levin, 2016). The California Department of Motor Vehicles advised Uber that "it is illegal for the company to operate its self-driving cars until it receives an autonomous vehicle testing permit" (Lee, 2016). The attitude of Uber is very 'interesting'; it stated that "companies should be able to engineer and operate self-driving technology … complex rules and requirements could have the unintended consequence of slowing innovation" (Levandowski, 2016), ignoring the fact that innovation without appropriate safeguards can have the unintended consequence of killing/maiming road users.

It is important to recognise that innovative technology can and does malfunction. An excellent example of this is the behaviour of Colonel Petrov, who was the duty officer at the USSR's centre for monitoring its early-warning satellites over the United States on 26 September 1983, when he had to deal with their early-warning system warning that five intercontinental ballistic missiles had been launched from an American base (Chan, 2017).

It was during one of the most tense periods in the Cold War, with the USSR having shot down a Korean Air Lines commercial flight after it crossed into USSR airspace (killing all 269 people on board, including a USA congressman) just three weeks earlier, the leader of the USA (Ronald Reagan) having declared the USSR an "evil empire", and the leader of the USSR (Yuri Andropov) being obsessed by fears of an American attack. Petrov had to decide whether to initiate action which would probably have resulted in the USSR launching a retaliatory attack.

Petrov decided to treat the alert as a system malfunction. He later explained that it was a 'gut decision', based on his distrust of the early-warning system and the small number of missiles that the early-warning system had detected (Chan, 2017). The false alarm was apparently caused by the system misinterpreting sunlight reflected off clouds as highly reliable evidence of a missile launch, due to a computer programming error. The USSR had apparently implemented the system in response to the USA implementing a similar system.

While the situation in 1983 is somewhat different to the situation relating to AVs, there are some 'lessons' to be learned, namely the need to recognise that technology can and does malfunction, the need to avoid being beaten by a competitor, and the need for the decisions to involve a wise human with full situational awareness.

It is interesting to note that Litman (2015) suggests the main benefits of AVs will be: reduced traffic and parking congestion; reduced road and parking supply requirements; greater mobility for mobility-disadvantaged people; reduced need to subsidise public transport; increased safety; reduced consumption of energy; reduced emissions (greenhouse gases and pollution). However, given the results of the above-mentioned research, there are real grounds for doubting whether these benefits will materialise.

Regarding the desired characteristic of our transport system, as set out in NZ Transport Strategy (Ministry of Transport 2008), it is very doubtful whether AVs will assist much. The willingness-to-pay data indicate that many people will find AVs unaffordable.

Greater integration might be achieved if AV use were to be focused on travelling to/from public transport hubs, but there is little evidence that the promotors of AVs are promoting this use of AVs.

The human factors research indicates that AVs will not produce the sort of safety benefits touted by promoters of AVs. While responsiveness is likely to improve with AVs, it is very doubtful whether AVs will improve sustainability. The economic development benefits are likely to accrue to those countries involved in producing AVs.

Access and mobility for some sectors of the community (e.g. the mobility disadvantaged) should improve with AVs, and AVs are likely to do little to protect and promote public health by encouraging the use of active modes of travel.

The effect of AVs might well be to reduce network capacity, and there are major legal and ethical issues which are not being addressed properly. The security of AVs and the potential for their ADS being 'hacked', is another major issue, given recent terrorist activities overseas.

Kaplan (1964) stated that "a scientist formulates problems in a way which requires for their solution just those techniques in which he himself is especially skilled." The manner in which AVs are being promoted suggests that transport problems are being formulated in the same way.

Intelligent transportation engineering requires a more discerning approach, recognising the hype and vested interests associated with some options, and the 'optimism bias' displayed by many suppliers/promotors of innovative technology. Decisions should be based on evidence and not ideology.

There are good, well-proven low-technology options for achieving some objectives (e.g. improving traffic safety), and they should be implemented now, rather than waiting for development of high-technology options, which might well not give a significant improvement.

Transportation engineers should be pro-active in setting objectives and specifying what is needed to achieve them, and should not simply be passive recipients of new technology.

***References available on 2018 conference website.***

# Getting confused at a higher level

## Urban mobility lessons from summer school at the University of Amsterdam

*Claire Pascoe works at the NZ Transport Agency as the Lead Advisor Urban Mobility. Thanks to the Transportation Group Study Grant, she attended the Planning a Cycling City summer school at the University of Amsterdam this June/July.*

Three weeks in Amsterdam was the mobility version of a yoga retreat for me. The daily ritual of riding, reading, learning and reflecting left me feeling a lot more nimble not just flowing through the streets of that great city but in the way I think about the opportunity here at home.

The academic programme had a huge amount of content to digest, and was designed to ensure we didn't get the sales pitch version of how the Dutch came to have such a high mode share for cycling. We needed to become 'confused at a higher level'.

Marco Te Brömmelstroet – the Dutch cycling professor – was our guide. He started by debunking common myths such as 'build it and they will come'. He corrected that one to be 'Build it, connecting meaningful destinations in a robust network, then maintain it, sell it, evaluate it and adjust it, and over time they will come.' He informed us that much like a virtuous football player, the Dutch are 'unconsciously skilled' when it comes to designing for cycling and their situation came about with very few cycling related policies or plans.

The Dutch were protecting city heritage and local commercial vitality, making pragmatic decisions around road rules and crucially, attempting to stop so many of their kids getting killed by traffic. We weren't going to receive a step by step manual (doh!), we were going to learn how to ask better questions.

Giselinde Kuipers, a professor of cultural sociology, gave a guest lecture on the Dutch 'national habitus' of 'conspicuous non-consumption' which helped provide some context for why everyday utility cycling stops at the border. Riding in the Netherlands doesn't define you, or say something about your personality – it's just a habit.

The bicycle kept the Dutch grounded, including their political leaders and royal family, all who recognised the egalitarian symbol the bicycle represents. In stark opposition to the countries our classmates represented, people ride there because it's normalising.

The absence of a car industry in the Netherlands and Denmark is also thought to have contributed to the less enthusiastic embrace of the automobile. Have the rest of us been duped? Our Italian colleague from the most polluted city in Italy, and home to Fiat and Ferrari, was certainly reflecting on the impact the automobile industry had on their mobility culture.

During our summer course, we were introduced to auto-ethnography as an approach to research. This basically meant we were feeling our way to understanding, with help from experts and literature. Our assignments were to write up the reflections we'd made as we moved around using different modes of transport – how we felt, what we observed others feeling, how mobility was functioning etc.

Coming straight from my desk at NZTA, it all sounded a little wooly to me. It was in fact a very eye-opening experience and a refreshingly intuitive alternative to more technical study. It made me wonder whether we should be incorporating auto-ethnography into the business cases approach – eg. how would these options feel? Here's an excerpt from my first assignment:

The very first thing I noticed when I landed in Amsterdam a week ago was how quiet it was. Not dead silence, but human-scale noise. As I walked through the

city, I could hear people chattering to each other, the purring of bike wheels and the church bells ringing. I smelt a mixture of pastries and sweet 'coffee shops.' ….

After a few hours I noticed that my body was relaxed, and all the tension I seem to carry around when you're crossing busy roads at home, looking left and right then left again, then making a dash, or when you're on a bike sharing a bus lane, wasn't there – people just seemed to flow.

The programme naturally exposed us to the mouth-watering infrastructure that has become like mythology in our countries. But even that wasn't quite as we thought and we quickly learnt that the history of separating drivers and cyclists was an automobile-centric response to growing conflict on the road.

The Cyclists' Union was initially very resistant to being cast aside on the road, as they felt it was an affront to their fundamental rights. Still to this day you see large-scale investment in cycling infrastructure made from motorway budgets that are seeking travel time savings for motorists.

The Hovenring in Eindhoven (photo above) is a good example of how a Dutch "car city" approaches transport improvements.

The high quality separation reminded me of our very own recently completed Hemo intersection in Rotorua (below). I was thrilled to see this New Zealand example come to life while I was overseas contemplating our own context.

When I visited the Hovenring, this was my observation: Ruth Oldenziel presented a challenging perspective on modal separation, and employing 'technological' rather than 'user-driven' design in her article on 'Contested Spaces'. We had this in mind while experiencing Eindhoven yesterday, where cars and people are in many places literally travelling on different levels.

On one hand it appears to be seamless travel paradise, but on the other hand, I noticed a distinct difference in how much interaction we were having with others. We weren't using eye contact, we had less priority at the lights and people in cars weren't giving way"'

So did all this mean separation wasn't the nirvana we all thought it was? Well, it was more complicated than that of course, because separation is the safety cousin of slower speed, and they play complementary roles on an urban network. Both are needed, but in different contexts.

A large percentage of residential and urban areas, especially in Amsterdam, seemed to be made up of slow mixed streets where speed had been democratised and the bicycle was usually the most efficient way of getting around. The slow speeds serve several purposes.

Firstly, they balance out the attractiveness of modes so that for short trips, the faff of getting in your car to go to your nearby shop doesn't really stack up – especially because finding a carpark isn't easy.

Secondly, the slower speeds reposition the car as a guest and shift the power dynamic on the street. Their road sign 'auto te gast' (below) literally means 'Car to guest' – a beautiful verb we don't have in the English language. This means they can avoid spending significant amounts of money on separation, special features or lots of signs and signals. At 30km/hr, humans can actively negotiate and the negotiations are much fairer between modes.


Thirdly, slow speeds feel safer as well as making it actually safer. Every few days, you experience an awkward interaction with someone as you weave

around a parked truck, or come up to an intersection but as your tyres or feet 'almost' collide, actual conflict was rare because people had enough time to react.

On the one occasion I saw some wheels actually collide, there was an embarrassed laugh and a rub of the knee, not an ambulance siren and a family that won't have someone coming home that night. No doubt slower urban speeds are a large contributor to the significantly better road safety record the Netherlands has.

It was encouraging to hear from my classmates about the growing global movement of cities using a range of low cost tools to slow residential and inner city speeds to 30km/hr. Our class was particularly enchanted by the 'Superblock' approach that Barcelona is taking. The city is implementing a plan to open up streets within a three by three 'superblock' by closing it to through traffic.

The ambitious plan seems to have cross party support, and the first two trials, while initially facing the usual fierce opposition, now seem to be working. The plan is not only seeking to improve the safety, attractiveness and environmental performance of the city, it's main selling point is that it's reclaiming around 670 hectares of public space for people to enjoy at a very low cost.

Vancouver was also taking a simple approach to humanising their residential areas. A small garden, only permeable by foot and bike, at the end of every second residential street – creates a very inexpensive walking and cycling network while still allowing every resident to get to their house by car (see image below).

So what did all this mean for mobility in Aotearoa? To me it means we need to keep working to broaden the conversation so we can seriously challenge the cultural hegemony of the automobile in our cities and embrace the opportunity to improve people's day to day lives.

Transport in New Zealand has been primarily a technical discipline. It seems that what we're after from our urban mobility systems at the moment may be adaptive, rather than technical, change. Adaptive change is "more difficult to define, involves the giving up of beliefs and habits, involves loss and risk, requires experimentation and new ideas and is inevitably countered or opposed at a systemic level".

This will require us to reach out and bring in different expertise. We need some change managers. We need some branding experts. We need story tellers, children, migrants, academics, human-design experts, sociologists. Maybe we even need some therapists?

***Rather than feeling frustrated and annoyed at the 'conflict' between people on foot and people on bikes, we should be celebrating our ability to actively negotiate with each other and be looking for more opportunities to put these skills into practice***

When did transport become so technical? The innocuous way we all use the word 'cars' where we mean 'car drivers' is probably just one symptom of the fact our transport system was designed with machines, rather than people in mind. While this seems a harmless mistake, how much does it represent a wider trend towards technical, rather than human responses to mobility problems? Is the way we're currently framing road safety sending us down a similar trajectory?

And how much does that serve to further weaken a culture of trust and tolerance on the streets, and reduce our ability to negotiate using our brains and senses rather than blindly following signs? There's no amount of 'Share the Road' billboards that can replace collective trust but trust isn't built by optimising machines, and marginalising humans.

I also think we need to carefully consider some of the language we reach for when we talk about transport. 'Freedom' and 'choice' are two great examples. Turns out it doesn't matter if you drive an SUV, ride a Harley Davidson or get around by bicycle – we all consider our preferred mode of transport to embody freedom and provide us with choice so, to steal a term from marketing, neither of those words provide a 'Point of Difference.'

If we're trying to inspire change in our towns and cities, maybe we need to be more specific. Are we talking about a system that provides choice or the private choice of individuals? Or are we talking about rebalancing the choices so they are equally convenient, meaning some choices will become more attractive, and some might become less attractive?

We should also be asking questions about our transport models. On our course we spent a day thinking about how 'All models are wrong, however, some are useful' (Box, 1978) and how even our transport models have been embedded with machine-centric assumptions. Are the transport models we use in New Zealand still serving our needs in urban settings or could alternative ways of modelling, like system dynamics, lead us to different, more useful and people-centric conclusions?

When you visit Amsterdam you see a different version of mobility paradise than the driverless car techno-utopia that's currently in vogue. It's not complicated in a way an algorithm could figure out, it's complex. It's pragmatic anarchy but people have been empowered to operate using their human abilities and good nature.

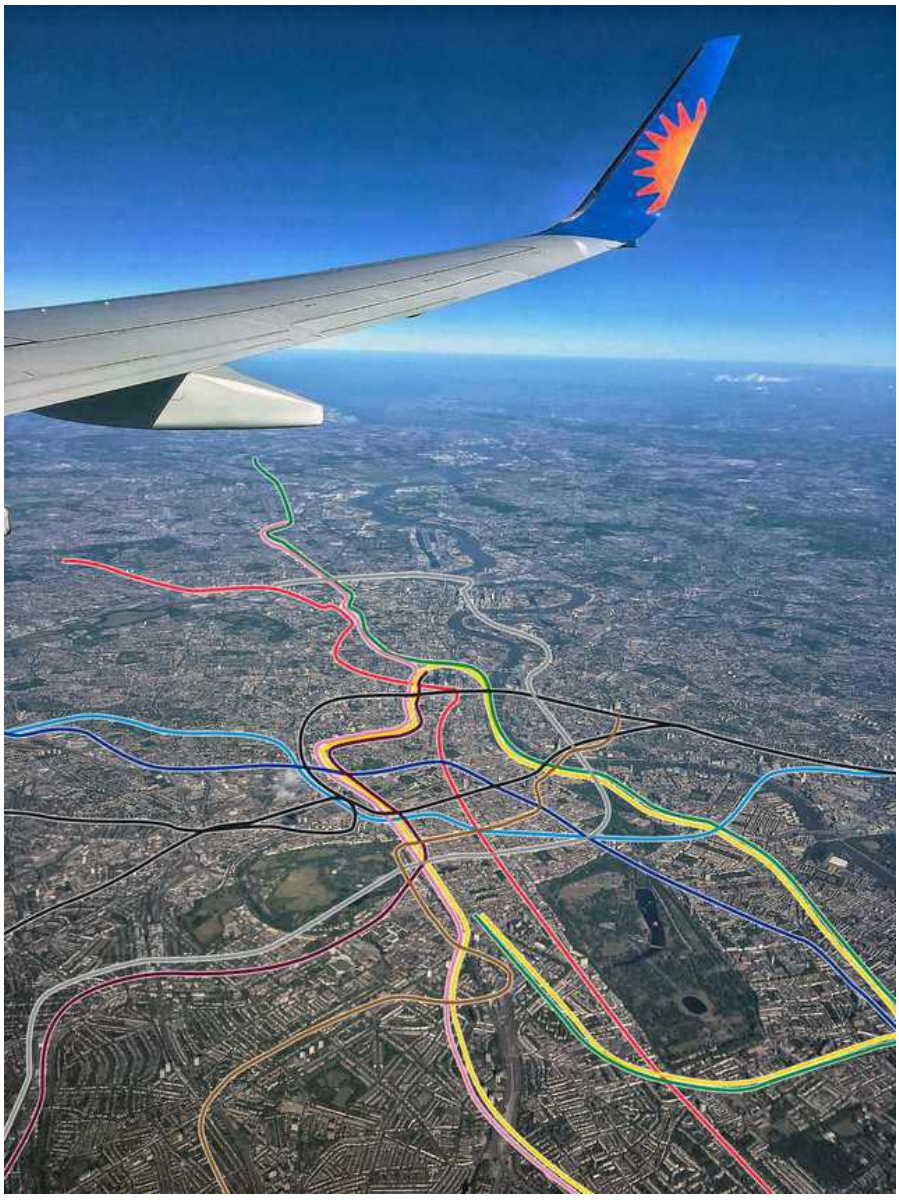
It made me view the Wellington waterfront in a completely different way. Rather than feeling frustrated and annoyed at the 'conflict' between people on foot and people on bikes, we should be celebrating our ability to actively negotiate with each other and be looking for more opportunities to put these skills into practice.

On a final note, one of the most delightful pieces of evidence that confirmed for me the impact of creating a human scale city was when our classmate Felipe reported that his three year old daughter Lucia, who had been riding around in a cargo bike (right) for three weeks, had asked if the family could move to Amsterdam from Washington DC.

This from a tiny person with no concept of urban design, transport planning or engineering – all she knew is that it felt good. What would happen if we replaced travel time savings with that metric as our new performance measure for urban mobility?


***Interested in a study tour of your own?***
***Keep an eye out for the next call for applications for the Transportation Group Study Grant***

TRANSPORTATION GROUP NEW ZEALAND



*London as seen from the air, with Tube lines superimposed.*

# 2WALKandCYCLE Conference Reviews

**Official Review:** 'Moving Towards Healthy Communities' was the theme of the 2WALKandCYCLE conference held in Palmerston North between 30 July – 1 August.

The conference presented an impressive range of international and national researchers and practitioners who spoke about the methods, policies and programmes they've used to promote walking and cycling, with a focus on ways that active, human-powered transport can help achieve the goal of healthier, smarter and more liveable cities.

Approximately 200 delegates attended the three day event, including transport planners and engineers, researchers, architects, academics, politicians and active transport advocates. Palmerston North welcomed its guests with a fine display of weather and

welcoming colourful road art outside the venue.

Day one of the conference began with an opening speech form the Palmerston North Mayor, before the microphone was handed to headline 2WALKandCYCLE guest speaker Lucy Saunders.

Lucy is a consultant in public health in London who has developed the 'Healthy Streets Approach' which looks at a human health and quality of life-centred approach to public planning and management. Conference delegates were treated to several presentations by Lucy throughout the event and were given several informal interaction opportunities at various activities.

Later that evening a function was held with the theme 'welcome to Japan', with various sushi and drink tastings provided. Delegates were also treated to traditional music performance by the students of International Pacific College.

Day two began with presenters from the New Zealand Transport Agency and Living Streets Aotearoa. Representing the New Zealand Transport Agency, Kevin Reid began the presentations by sharing reflections on the recently published draft GPS on Land Transport, with Claire Pascoe also showcasing highlights of her summer school experience in Amsterdam. Former Wellington Mayor and current Living Streets Aotearoa executive Celia Wade-Brown then shared her lessons learnt from walking the Te Araroa Trail.

The afternoon of day two provided delegates with a range of tours to showcase different walking and cycling attractions in Palmerston North. Tours ranged from both off-road and on-road cycling, an urban artwork trail in the CBD, the He Ara Kotahi pedestrian and cycle bridge, the Junior Road Safety Park, and a trip to the Manawatu Gorge.

Following the afternoon of tours was the much awaited 2018 Bike to the Future Awards and conference dinner. Those in attendance were dressed in accordance with the evening's theme of 'tux, ties and tiaras', although many decided to dress more flamboyantly.

Day three saw a few tired faces attend the last of the conference speakers. The second notable guest speaker was Julie Anne Genter who took the place of Minister of Transport, Phil Twyford.

Julie stressed the message that future measures the government would be taking to make walking and cycling more convenient, would come with a backlash from motor vehicle users. However, the appetite for walking and cycling is growing in New Zealand and it is expected to continue with investment opportunities for local government ever increasing.

The 2WALKandCYCLE conference proved to be a success for both organisers and delegates. Palmerston North was able to showcase its convenient and easy living lifestyle and ultimately living up to its vision of "small-city benefits, big-city ambition". A big thank you to the national and local committee, event organisers and other key stakeholders who each played a crucial part in the success of the event.

**Attendee Review: Palmy Rocks!**
Yes, it's true…….as we found out at the 2Walkand Cycle conference in Palmerston North this year. I had heard earlier in the year at the Urbanism NZ Conference that there was a big push to revive the heart of the city through events and funky urban initiatives such as parklets and street art.

I wasn't disappointed, as the Council had laid it on with some tactical urbanism right in front of the conference centre. Overnight they had painted the drop off area and adjacent intersection, and chucked some bean bags around on the entrance forecourt – boom!

The conference is held every two years and always has great key note speakers, this year was no exception with London's Lucy Saunders and her 'Healthy Streets' bringing together walking and cycling into essentially great street design. She isn't a fan of terms such as multi-modal, it's just about places for people.

On top of her clever 10 healthy street indicators she gave us much more to think about regarding the language we use, particularly when engaging with the community. I mean do the public really understand and care about levels of service, NOPs, AADTs, etc etc.

As with the Transportation Group Conference this year the theme of community engagement was woven throughout the proceedings; it a critical part of what we do - speakers had successes and lessons to share from both NZ and international projects.

There were also technical talks, NZTA updates, talks about NZ cycle trails being developed and much more. It was really hard to choose between some of the parallel sessions as it was all so interesting. To see more go the presentations that are available at http://www.2walkandcycle.org.nz/

The field trips were well attended and offered people a range of places to visit on foot or bike. I went on the city centre walking tour and discovered more painted intersections, parklets and many street art projects involving the community and council working together. The 'Little Cuba' precinct was particularly cool. Thanks Keegan and Dave from PNCC.

And of course, no good conference is complete without the social events including a Japanese-themed Welcome Function on the Monday. The dinner on the Tuesday night was also the 2018 Bike to the Future Awards dinner, where the dedication of all the cyclists, people and organisations pushing to make cycling a more attractive transport choice were acknowledged.

Christchurch's Uni-cycle Major cycleway took out the supreme award – well done! Lucy Saunders noted the following day that she has never been to a conference dinner like it, seems they are well behaved in the UK, no stage diving for them! Looking forward to the next one and hopefully the host town will rise to the challenge regarding painted intersections!
*Jeanette Ward*

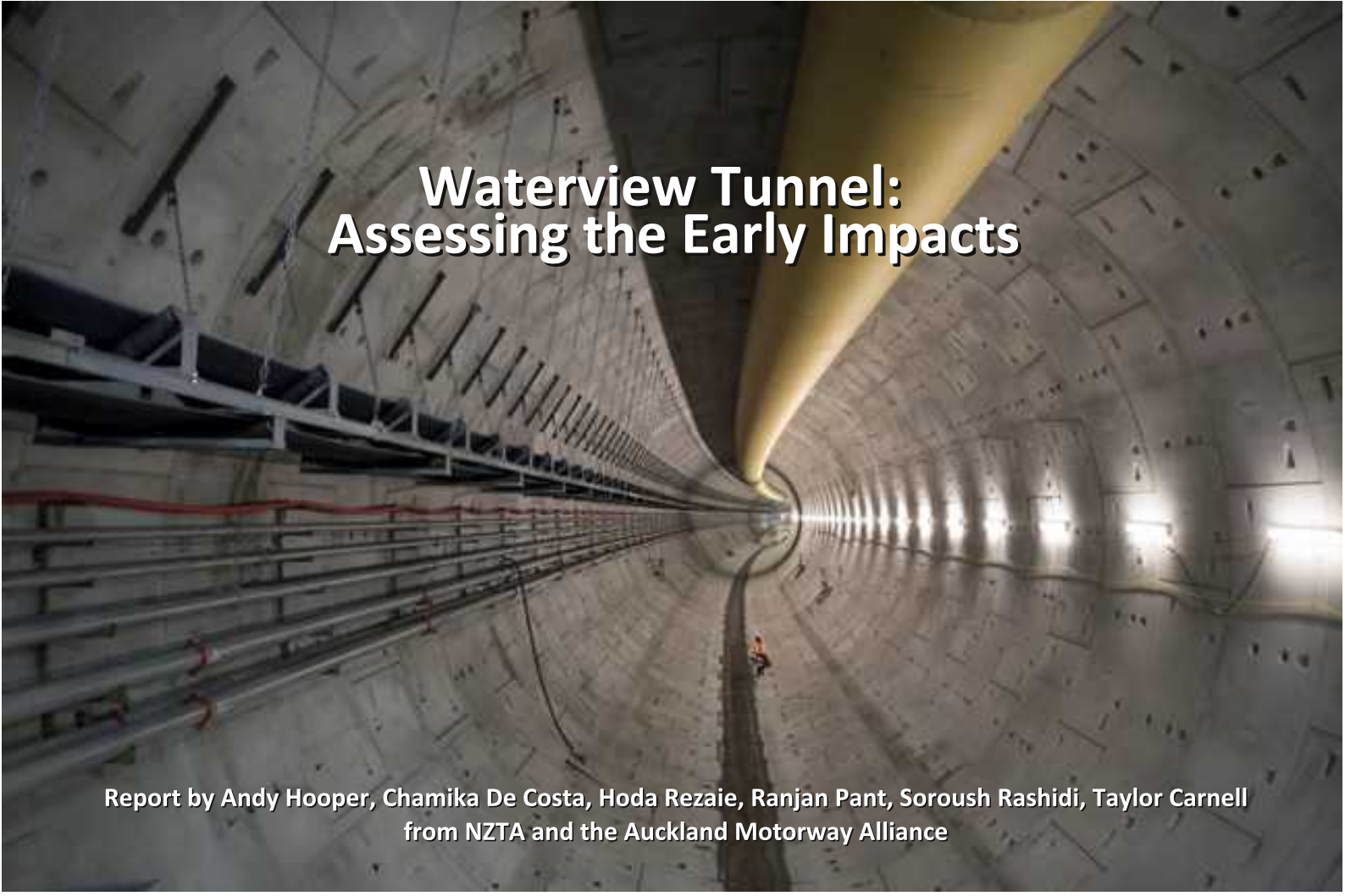
# Cycling Network Guidance now available

After a lengthy ratification process, the NZ Transport Agency's Cycling Network Guidance web-based resource for the planning and design of cycling networks has been ratified.

This huge resource supersedes the 2004 Cycle Network and Route Planning Guide and the NZ Supplement to Austroads Part 14. As well as holding a huge amount of original content, it also links through to many other authoritative guides and manuals.

It will be updated on an ongoing basis with case studies and smaller pieces of design guidance as they are ratified. Go to: www.nzta.govt.nz/cng

Another note is that the Transport Agency website also now holds a collection of handy guides relating to walking, cycling and public transport all from the same page: www.nzta.govt.nz/multi-modal-transport/ which you're welcome to share with other practitioners.



# Waterview Tunnel: Assessing the Early Impacts

Report by Andy Hooper, Chamika De Costa, Hoda Rezaie, Ranjan Pant, Soroush Rashidi, Taylor Carnell from NZTA and the Auckland Motorway Alliance

Auckland, New Zealand's most populous city with 1.6 million residents, is located at the narrowest neck of the country, flanked by harbours on both sides. These bodies of water effectively separate the city into five distinct urban areas: the central isthmus (including the main CBD), surrounded by; the North Shore; Manukau to the south; Waitakere to the west, and the Eastern suburbs (as indicated in Figure 1). Each of these areas contains both significant housing and employment, with the largest concentration of employment in the main CBD located just south of the Auckland Harbour Bridge.


*Figure 1 – Auckland's motorway network*

Auckland's urban motorway system consists of five interconnected, bi-directional motorway corridors, three of which extend radially from the CBD. The total length of the motorway network within the urban area is over 750 lane-km and motorway links are the only road connections of any significant capacity to span the main bodies of water and connect the separate land masses (and in several cases the only connections of any type). Although the motorway system represents only 4% of the length of the regions' road network, it carries some 30% of the total vehicle-kilometres travelled. The motorway system carries in excess of 1.1 million vehicle-trips per day, some five times that carried by the public transport system. Auckland is currently experiencing record population growth of around 70,000 people per year (4%) with around 45,000 additional cars on the road each year.

Due to Auckland's positon on a narrow ribbon of land, its motorway system functions as both: a national strategic link for journeys between Auckland and the rest of the country (and north-south journeys passing through Auckland); and the main commuter and freight links within the Auckland region. The average trip length on the Auckland motorway system is between 12 and 13 kilometres and trips passing through Auckland with origins and destinations in neighbouring regions to the north and south account for only 1-2% of all trips.

The motorway system experiences significant peak period congestion on a daily basis (with peaks extending to 3 to 4 hours) and a lack of realistic alternative non-motorway routes or modal choices for many journeys means that even relatively minor incidents can seriously impact the operation of the region's entire transport system.

**Network significance of the new Waterview Tunnel**

The Waterview Tunnel (WVT) is a new link that connects State Highway 20 (Southwestern motorway) to State Highway 16 (Northwestern motorway). Opened in July 2017 the WVT forms the critical link in the Western Ring Route (WRR), an alternative route connecting the Auckland region both internally and to other regions by connecting State Highway 1 at the northern and southern ends of Auckland via State Highways 20, 16 and 18.

The WVT link also significantly improves accessibility within the Auckland urban area between several areas of the city separated by water, especially Waitakere to the west and Manukau to the south, as well as providing greatly improved road connections between the CBD and airport.

In addition the new link provides an attractive alternative route between the southwestern extremity of the isthmus area and the CBD on the northern edge of the isthmus. This is attracting a significant number of vehicle trips to the motorway system that previously exclusively used arterial routes to access the CBD. Furthermore, the WVT link provides a number of alternative, full motorway routes between all four main areas of the region, providing a level of route choice not experienced previously by Auckland motorway users.

**Short term volatility of traffic patterns and congestion**

The fundamental step-change the WVT link represents to regional road connectivity is the most significant since the opening of the Auckland Harbour Bridge (AHB) in 1959. The shock the opening of the AHB imposed on traffic patterns is well-known in Auckland folk-lore (Figure 2 below indicates traffic on the AHB on its opening day)

*Figure 2 – Auckland Harbour Bridge on opening day, 1959*

Strategic assignment modelling using the Auckland Regional Transport model undertaken as part of the WRR investigation and design indicated the expected long term routing patterns under normal (non-incident) operating conditions, once the operation of the network settled. However, over a short timescale of up to several weeks following the opening of WVT, usage and demand patterns were expected to be in flux as travellers: used the tunnel for the first time; modified their route choices out of 'novelty value' of using the tunnel; and systematically explored new routing possibilities that may improve their daily travel experience.

Operational modelling of the post-WVT motorway network undertaken by the Auckland Motorway Alliance (AMA) using a purpose built first order macro simulation model of the entire motorway system indicated relatively small changes in the pattern of demands loading the new motorway network could lead to large changes in the congestion patterns.

As a result, from an operational standpoint the opening of WVT was viewed as a 'shock' to the operation of the motorway system, and a period of operational instability or volatility was anticipated once the WVT opened.

This paper provides both an overview of the early impacts of the WVT on the Auckland motorway system and a description of the novel data analysis and reporting system that was purpose built to deliver rapid performance reporting capability.

**SHORT TERM NETWORK PERFORMANCE REPORTING**

A full comprehensive evaluation of the impact of the WVT on the Auckland transport system will be carried out, initially reporting after the first year of operation. However a need was identified to provide daily network performance reports during the period of anticipated operational instability immediately following the opening of the WVT. These reports were needed to service two distinct audience groups:

1. Operations staff at the Auckland Transport Operations Centre (ATOC)
2. Senior Leadership at the New Zealand Transport Agency (NZTA) and Ministry of Transport.

Whilst a WRR Concept of Operations, Operational Plans and Standard Operating Procedures had been drawn up for the WRR to assist ATOC staff, these focused on the new 'business as usual' operations expected after the settling in period. A more reactive approach was required in the first few weeks following opening to allow operations staff to make daily changes to both traffic management systems (the network-wide Ramp Metering System (RMS) and the regions' traffic signal system which operates on SCATS) to dampen any swings in demand patterns and traveller information provision (via VMS, broadcast and social media).

The Senior Leadership at the New Zealand Transport Agency (NZTA) and Ministry of Transport (MoT) required up-to-date information on the overall operation of the motorways (and wider transport system) to engage with politicians and the media.

Congestion, the transport system and the strain associated with Auckland's growth are hotly debated in both mainstream and social media, and debate about the improvement or otherwise following the opening of WVT was anticipated to occur immediately, irrespective of any comprehensive impact evaluation due months later. Strongly held differing views existed prior to WVT opening as to whether the WRR, and the WVT in particular, are long overdue upgrades to a motorway system that was never completed; or misplaced investment that would have been better directed to improving the regions' underdeveloped public transport system.

The expected redistribution of motorway congestion patterns along with a number of ubiquitous sources of widely available real-time traffic and travel time meant there would be a lot of potential for interested groups to cherry pick evidence to support widely divergent views about the operation of the transport system in the days following the opening of the WVT. Therefore a need for robust and objective assessment of the motorway system as a whole was identified, that both accounted for redistribution of congestion patterns and

how variable those patterns were day-to-day until the system settled.

**Data Sources and Data Fusion Tools**

Auckland's motorway system is highly instrumented in terms of traffic detection, to support existing operational systems, such as the coordinated ramp metering system (RMS) as well as legacy systems. This consists primarily of point sensors: thousands of loop detectors, a small number of radar/infrared sensors and more recently around 70 Bluetooth detectors. In addition probe-based GPS data sourced from commercial providers is now being used to provide comprehensive travel time data.

In order to meet the rapid reporting requirements, whilst effectively handling, cleaning and analysing the vast amount of data available, the AMA developed the Motorway Analysis and Reporting System (MARS). This is a hybrid system that combines real-time traffic data sources with an online first order macroscopic simulation model of the entire motorway system that has been reported on previously (Hooper et al. 2016).

This approach synergistically combines the strengths of both real-time Big Data sources and macroscopic simulation modelling, whilst simultaneously minimizing the weaknesses of each in what can be thought of as a "production line" for improving data. Figure 3 provides a diagrammatic overview of the system.

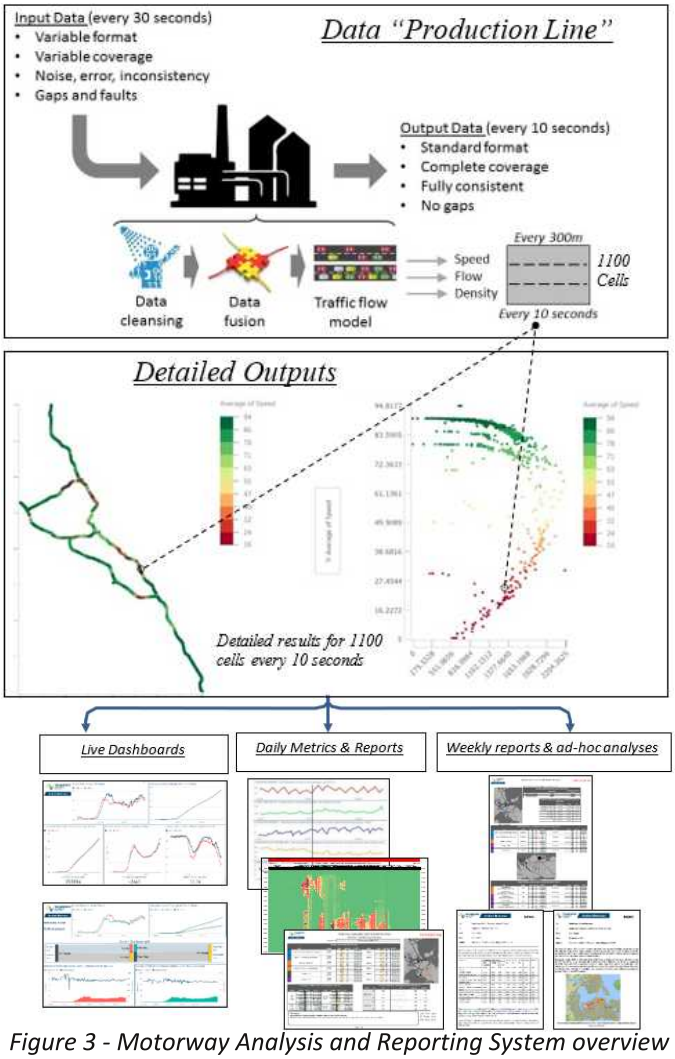



*Figure 3 - Motorway Analysis and Reporting System overview*

MARS handles around 3 million lines of input data per day and its principal benefits for daily reporting network level performance of the motorway system during the shock of the WVT opening period can be summarised as follows:

1. Traffic flows are internally consistent giving a correct picture of the traffic state for every 300m section of the motorway network in terms of speed, volume and density, rather than just where detectors are located (i.e. it in-fills gaps between detectors in accordance with the fundamental traffic flow equation and the law of conservation of vehicles, overcoming inconsistent flows that are often seen at adjacent detector sites).

2. The system is resilient to both systematic detector error and multiple isolated detector failures with minimal degradation of quality (due to its ability to in-fill indicated above).

3. The system is able to filter both systematic error and much of the noise (random error) associated with the real-time data sources providing a significantly smoothed output data (it in effect acts like a large signal processor).

Testing has shown high levels of accuracy of system outputs against:

- The official traffic counting stations at 50 dispersed locations around the motorway system (these are separate to the more numerous RMS loop detectors, do not provide real-time data into the analysis system, and are positioned and calibrated to provide highly accurate traffic counts).
- Corridor travel times from independent commercial probe data-based sources (Google, TomTom).

**EARLY RESULTS**

Note that the results presented here provide an early informal indication of the impacts of WVT on the motorway network. Baseline values from June 2017 before WVT opened have been used for convenience and to provide comparison over as short a period as possible to limit seasonal and growth effects, with Post-WVT results from August and September being presented. The Post Implementation Review that is being undertaken will include work to select the most appropriate baselines and counterfactuals for a formal evaluation.

Five summary network metrics were designed to provide an overview of the short term impacts of the Waterview tunnel on the performance of the entire motorway system through daily tracking (see Table 1). These impacts and their key implications are the "headline impacts" suitable for senior management and board level reporting. The impacts are summarised in Figure 4 and indicate an improvement on all measures since the opening of WVT.

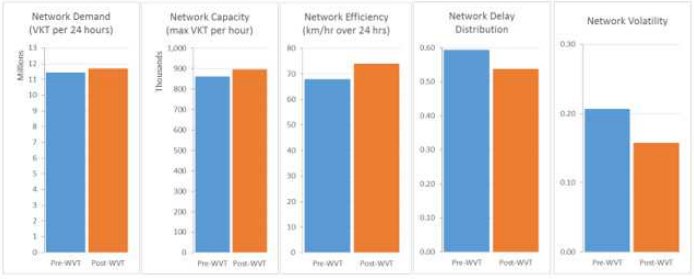



*Figure 4- Changes in network performance after WVT opening (last 2 weeks of normal demand before WVT)*

| Measure | Description |
|---|---|
| 1. NETWORK DEMAND | *The total kilometres travelled on the entire motorway network by all vehicles over a 24 hour period. Provides a measure of the overall load on the system.* |
| 2.NETWORK CAPACITY | *The maximum recorded network kilometres travelled in one hour.* ***Higher is better.*** |
| 3.NETWORK EFFICIENCY | *Quantifies the overall magnitude of delay around the motorway network and across the day without consideration of the distribution of delay.* ***Higher is better.*** |
| 4.NETWORK DELAY DISTRIBUTION | *Quantifies how concentrated delay is around the motorway network and across the day without consideration of the overall magnitude of delay.* ***Lower is better.*** |
| 5.NETWORK VOLATILITY | *Quantifies how variable the pattern of delay is around the motorway network and across the day, without consideration of either the concentration or the overall magnitude of delay.* ***Lower is better.*** |

*Table 1 – Motorway network performance summary metrics*

**Key Result 1: Re-distribution of Traffic Demands**

There has been an increase of over 290,000 kilometres of travel per day on all motorways combined. Whilst this is both small in the context of total daily kilometres travelled on all motorways (which exceeds 11.5 million per day), and is to some degree expected (due to the increase in motorway network length of 30 lane-km associated with WVT), it has had a significant impact on the local road network, with substantial reductions in daily traffic volumes recorded on many arterial roads around the central Auckland isthmus.

Redistribution of demand between motorways has seen the total kilometres travelled on the southern and northern motorways fall by 6-7% with a corresponding increase in total kilometres travelled on SH20 and SH16 (see Table 2 and Figure 5).

| Corridor | *Pre-WVT Total km per day (average for Jun-2017 Mon-Fri*)* | *Post-WVT Total km per day (average for Aug & Sep 2017, Mon-Fri)* | *difference* | *% difference* |
|---|---|---|---|---|
| SH1 southern | 3,824,917 | 3,590,157 | -234,761 | -6.1% |
| SH1 northern | 2,243,310 | 2,093,594 | -149,716 | -6.7% |
| SH16 | 1,590,431 | 1,730,600 | 140,170 | 8.8% |
| SH20 (excl WVT**) | 1,537,661 | 1,718,066 | 180,405 | 11.7% |
| SH18 | 545,755 | 530,458 | -15,297 | -2.8% |
| **excluding Fri 02 Jun and Mon 05 Jun due to Public Holiday* | | | | |
| ***the new sections of SH20 associated with WVT are excluded here to provide an apples-with-apples comparison* | | | | |

*Table 2 - Redistribution of traffic following WVT opening*

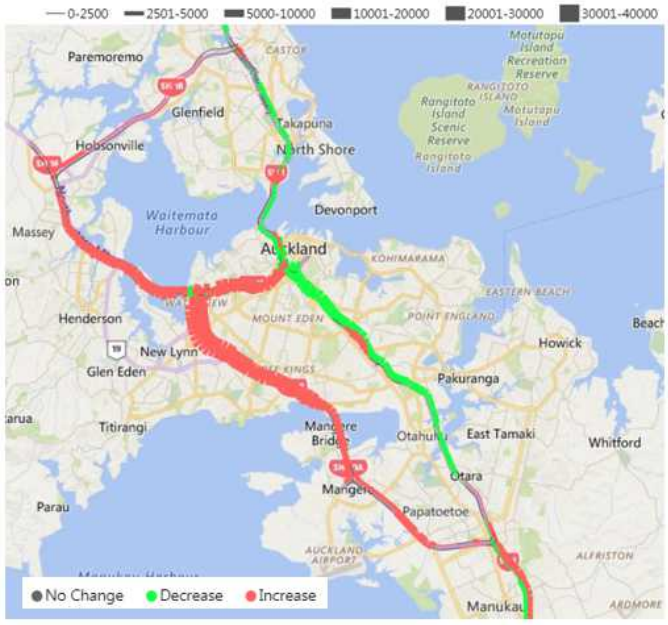



*Figure 5 - Changes in daily motorway traffic following WVT*

**Key Result 2: Improved Efficiency of the Motorway Network Asset**

The redistribution of motorway demands has led to more efficient operation of the motorway system overall, as reflected in the daily Network Efficiency metric values (see Table 3). This is resulting in congestion relief equivalent to between 8,500 and 10,000 less hours of total travel time per day on the motorways alone , as summarised in Table 2 (note: this does not account for reduction in overall travel time across the arterial network due to reductions in traffic volumes attracted to use the new WVT link).

| | *Post-WVT averages for Aug & Sep 2017, Mon-Fri, 24hrs* | | | *Pre-WVT average for Jun-17, Mon-Fri*, 24hrs* | *equivalent non-WVT total hours (24hrs)* | *congestion relief (hours)* |
|---|---|---|---|---|---|---|
| | *Total km* | *Total Hours* | *GAS*** | *GAS*** | | |
| | *a* | *b* | *c =a÷b* | *d* | *e =a÷d* | *f =b-e* |
| SH1 southern | 3,590,157 | 47,105 | 76.2 | 67.0 | 53,569 | -6,465 |
| SH1 northern | 2,093,594 | 28,402 | 73.7 | 67.3 | 31,094 | -2,692 |
| SH16 | 1,730,600 | 27,317 | 63.4 | 61.8 | 27,985 | -667 |
| SH20 (excl WVT) | 1,718,066 | 21,908 | 78.4 | 79.5 | 21,622 | 286 |
| SH18 | 530,458 | 8,507 | 62.4 | 61.5 | 8,629 | -122 |
| **excluding Fri 02 Jun and Mon 05 Jun due to Public Holiday* | | | | | **Total** | **-9,660** |
| ***GAS = Generalised Average Speed* | | | | | | |

*Table 3 – Average daily travel time savings since WVT opened*

**Key Result 3: Improved Reliability and Resilience of the Network**

Contrary to expectations, after the first day following opening of the tunnel the Network Volatility measure settled almost immediately to a level below the pre-WVT baseline which has so far been maintained through the return to normal demands following the end of school and university holidays. This indicates a higher consistency of congestion pattern in time and space day-to-day than before the tunnel opened.

The reason for this unexpected (but welcome) early result of improved reliability of the motorway system with the addition of the WVT links, may be due to the SH20-SH16-SH18 route being a viable alternative to SH1 for a number of trips of typical length. As well as a more efficient use of the network asset, it appears the redistribution of demand also allows the motorway system to more effectively absorb minor shocks, such as breakdowns and crashes during busy periods.

The easy availability of real-time traveller information from a range of sources may be assisting this by driving small marginal shifts of demand at peak times in response to minor shocks which is smoothing out some of day-to-day variability in congestion that was common prior to WVT opening.

Whilst there have not been many major incidents on the motorway network since WVT opened, the few that have occurred indicate the network has significantly improved in resilience (where resilience in this context is defined as the ability to absorb, adapt to, and/or rapidly recover from a potentially disruptive event).

This is illustrated by the most potentially disruptive incident that has occurred since WVT opened. On Friday August 25 at 12:55pm a truck rolled on SH1 at Green Lane interchange on the southern motorway, blocking all three lanes adjacent to Greenlane onramp. All lanes were re-opened at 13:58, and during the blockage a small amount of traffic (around 1,300 vehicles) filtered past the incident site under Police supervision using the hard shoulder.

During the incident SH20 via Waterview Tunnel (WVT) was actively promoted as an alternative route by ATOC and NZTA via VMS, radio and social media. A total demand shift to SH20 of 2,600 vehicles over two hours was measured via traffic count detectors compared to previous Fridays since WVT opened. An additional 2,600 vehicles over this period were judged to modify trips to avoid the incident location through diversion to arterial routes, re-timing or cancelling trips (assessed via traffic count detectors compared to previous Fridays since WVT opened).


*Figure 6 - Observed changes to demand due to 25 Aug incident vs. previous Fridays*

Using the AMA's purpose-built Rapid Scenario Testing Tool the net impact of the incident on the motorway network was estimated to be around 2,000 hours additional hours of delay over 24 hours (1.5%) with a recovery time of 1.5hrs. The impact was largely confined to SH1 with only minor secondary delay impacts on SH20 due to diverted demand.

The relatively modest impact of such a severe incident at a critical location is considered to be due to three main factors:
1. The rapid time in which the incident was cleared and all lanes re-opened (just over 1 hour)
2. The redistribution of motorway network demands since WVT opened, resulting in a 6%-7% reduction in demand day-to-day on the southern motorway.
3. The additional redistribution of demand away from the southern motorway to SH20 as a result of promotion of SH20 via WVT as an alternative route as part of the incident response.

To assess the contribution of the new WVT link to reduced impact and recovery time on SH1 two versions of the incident were assessed using the Rapid Scenario Testing Tool. One version of the incident replicated the demand patterns that actually occurred; the second replicated the same incident for pre-WVT network and demand patterns including:
• No background demand reduction of 6%-7% on the southern motorway
• No diversion of 2,600 vehicles to WVT and SH20.

In both cases demand reduction of 2,600 vehicles was applied to account for the observed diversion to arterial routes, re-timing or cancelling trips.

The results of the assessments are summarised in Table 4 below and indicated that the addition of the WVT link reduced the overall delays incurred on the motorway network by around 11,000 hours.

The congestion heatmaps in Figure 7 illustrate the increase in congestion that would have been experienced on SH1 had WVT not been open at the

| | Source | Description | a | b | c (a÷b) | d | e (a÷d) | f (b-e) |
|---|---|---|---|---|---|---|---|---|
| | | | Total network kilometres (24 hrs) | Total network hours (24 hrs) | GAS* | Base model GAS | Equivalent non-incident total hours | Additional hours of delay due to incident |
| (1) | Offline System | Equivalent incident without Waterview Tunnel (SH1 impacts) | 11,446,112 | 182,094 | 62.9 | 68.1 | 168,078 | 14,016 |
| (2) | Offline System | Replication of incident as occurred (SH1 impacts) | 11,568,877 | 171,975 | 67.3 | 68.1 | 169,881 | 2,094 |
| (3) | Real-time system | Adjustment for increased delays observed on SH20 SB due to diverted demand (1pm - 10pm) | - | - | - | - | - | 833 |
| *GAS = Generalised Average Speed | | | | | Overall impact: (1)-(2)-(3) | | | 11,089 |

*Table 4 - Estimate of incident delay avoided through WVT*

time the incident occurred (the direction of travel is from left to right and heatmaps cover the northern motorway from Silverdale to the southern motorway at Drury via Auckland Harbour Bridge and CMJ).


*Figure 7 - Comparative Congestion heatmaps for incident with (top) and without (bottom) WVT*

These heatmaps illustrate that overall recovery of the network would have been significantly worse had WVT not been available (both due to the more efficient distribution of demand across the motorway system generally, as well as the active diversion of demand to WVT/SH20 following the incident).

Overall recovery of the network occurs by 2.45pm in the replication of the actual incident (which aligns with observed data). However in the no-WVT scenario fully recovery doesn't occur until around 8.30pm, nearly 6 hours later. This is due to the timing and location of the incident relative to normal PM congestion patterns. Without WVT the network is unlikely to have recovered prior to the onset of the PM peak, which would have then been exacerbated by the backlog of traffic on SH1 that hadn't cleared.

The results of this assessment provides an early demonstration of the improved resilience of the motorway system that the connectivity of the WVT provides.

If this outcome persists in the longer term it will be an especially welcome result as two of the primary objectives of the WVT articulated during planning hearings were improved trip reliability and improved network resilience (New Zealand Transport Agency, 2010)

## CONCLUSIONS AND RECOMMENDATIONS

In order to effectively manage the settling-in period following the opening of the strategic Waterview

Tunnel link, there was a need to provide a rapid analysis and reporting system that would capture impacts across the entire of Auckland's motorway system. The MARS system was developed to make the most of: available real-time data sources; traffic flow theory; and innovative system level metrics that summarise the performance of the motorway system as a whole.

Results from the MARS system in the first three months following the opening of WVT indicated the following main impacts on the motorway system:

- Around 290,000 additional kilometres of travel is occurring on the motorways system each day. In addition, a re-distribution of demand has occurred away from the southern and northern motorways to the north western and southwestern motorways.
- This is resulting in a more efficient use of the motorway network asset through congestion relief equivalent to between 8,500 and 10,000 less hours of total travel time per day on the motorways.
- Experience so far indicates that the addition of the WVT link has improved the resilience of the motorway system to shocks such as major incidents through providing a number of alternative routes around the motorway system.

The current version of MARS represents a step forward in network performance reporting. The AMA see the progress so far as the first step towards a number of


*Figure 8 – MARS potential development pathways*

decision support tools that could provide significant enhancement to network optimisation and network performance improvement activities as illustrated in Figure 8.

Three main development paths are recommended:

1. Extend the capability and coverage of the MARS as a network performance measurement system, to include arterial networks and ultimately all transport modes.
2. Update the offline model fully to post-WVT conditions, and enhance the functionality and calibration to provide a detailed network optimisation support tool.
3. Develop additional modules to allow real-time prediction of short term future traffic conditions (by combining the two functions of offline prediction and real-time update).

# Entries open for Canterbury Road Trauma Awards

The New Zealand Transport Agency supports the Road Accident Remembrance Day. It is a large public event held in North Hagley Park annually.

RTA
ROAD TRAFFIC ACCIDENT TRAUMA CHARITABLE TRUST

In 2017, the event organisers, Road Traffic Accident Trauma Charitable Trust established the distinguished Canterbury Road Trauma Awards. The recipients of this years Awards will be announced at this years Road Accident Remembrance Day on Saturday, 3 November 2018.

This annual award recognises outstanding individuals, teams or professional organisations deserving of special recognition for their contribution to road safety, public education, road trauma prevention initiatives, and a professional duty of care in Canterbury.

This may include initiatives across all modes of land transport and may include engineering and technology, network optimisation, and demand management.

This award is open to industry professionals from non-profit organisations, private and public organisations that are involved in preventing the likelihood or severity of road trauma incidents.

Examples may include:

- Addressing an identified need, enhancing outcomes, or improving a product, service, process or system that as a direct result will benefit the wider community, particularly those in the Canterbury Region.

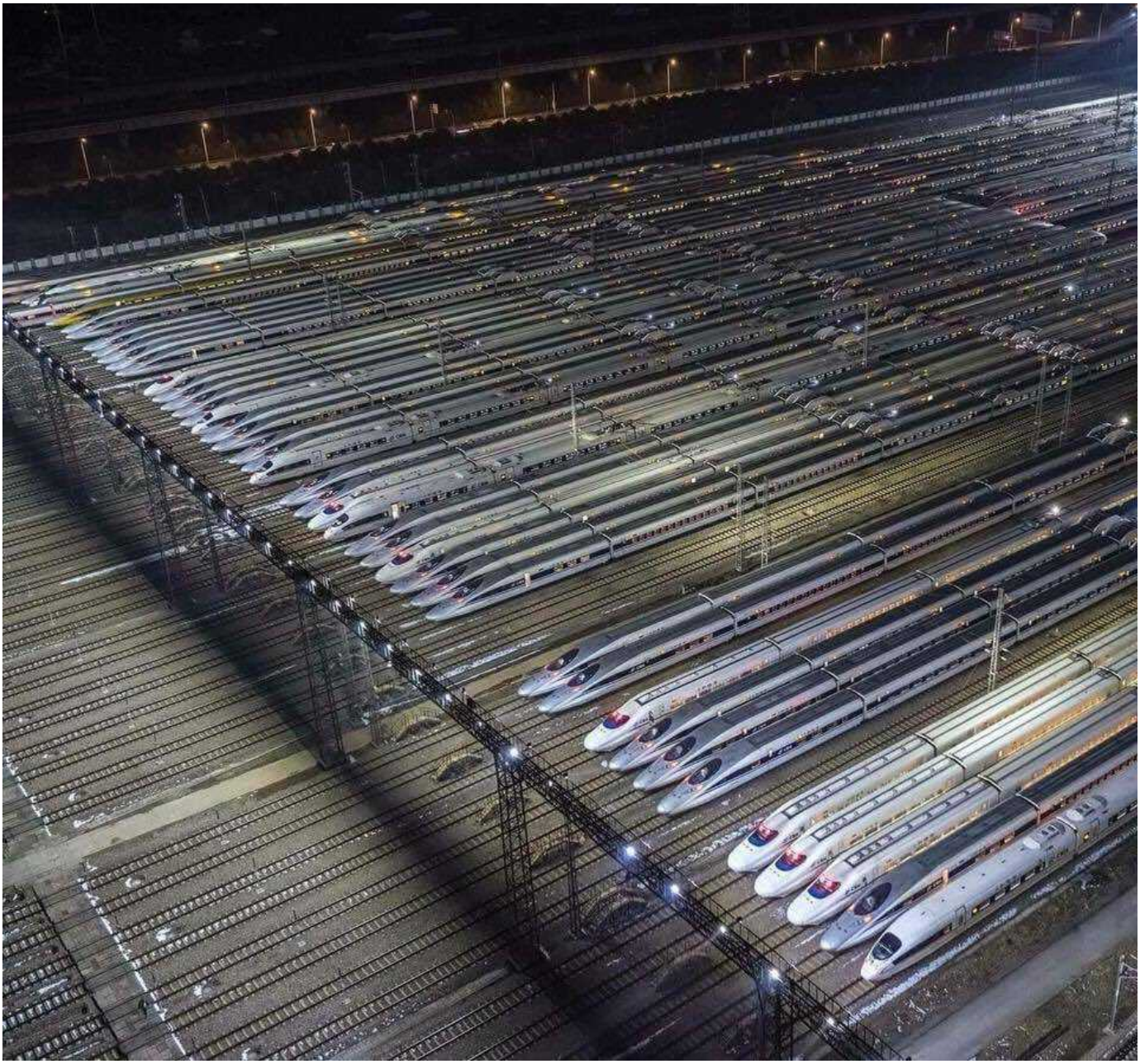
- Demonstrating commitment to enhancing or assisting in further development of the product, service, process or system that as a direct result will benefit the wider community, particularly those in the Canterbury Region.

The Transportation Group Network would like to encourage you to nominate your deserving peers for these distinguished Awards.

The New Zealand Transport Agency encourages companies in the transport and infrastructure sectors to think about ways they have installed systems or safety features into design in order to increase safety for road users, says Transport Agency Director Regional Relationships Jim Harland.

"Entering the Canterbury Road Trauma Awards is a way to acknowledge the work your teams are doing. These awards are a powerful way to raise awareness of road trauma and the long-term and ongoing aftermath of every serious or fatal road crash."

Nominations close on 30 September 2018. Click here for details



*Bullet trains lined up in Wuhan, China*


*Buses in Beverley, East Yorkshire were designed to fit through the town gate.*

# Active Modes Infrastructure Group Update

AMIG held its latest meeting in Wellington on August 17th, with some new reps from Palmerston North and New Plymouth councils present. The number of developments in walking and cycling planning/design being trialled, refined, or just discussed around the country continues apace, and it always seems surprising that we get to the end of the agenda reasonably on time.

Here's some key points of interest from the latest meeting:

• Some disability groups indicated that the black-on-orange **temporary path detour signs** are difficult for sight-impaired pedestrians to see and read, especially against the 'sea of orange' on a site. It was suggested that traditional white-on-blue pedestrian symbols would stand out more. This approach was endorsed in principle by AMIG, although the finer details will need to be worked out.

• **Crossing treatments** got some attention at this meeting in various ways. The question of how to mark shared walk/cycle priority crossings is being pondered in a few cities; would green/black or green/white zebra stripes achieve the necessary effect? There was also some discussion about whether zebra crossings on side-roads without belisha poles or US-style rapid-flashing beacons could be considered in NZ; neither appears to be widely supported at the moment.

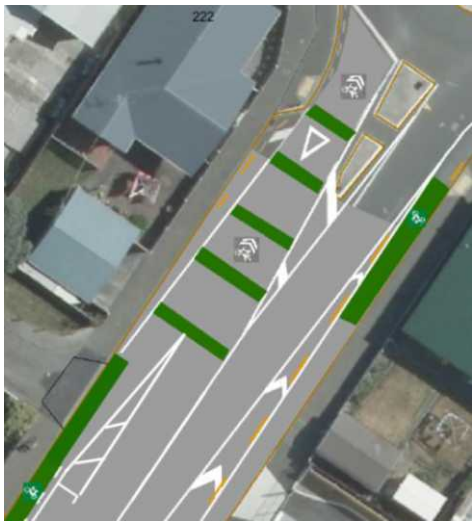

• There is some desire around the country in trying out **30km/h school speed zones**, in line with the growing interest nationally in speed management. NZTA has some concerns about national consistency and the potential for driver confusion with another school speed limit; there is also the challenge of achieving a subsequent mean traffic speed of no more than 10% over the 30k limit (in line with the Setting Speed Limits Rule). There is currently some work to review speed compliance at about 50 school zones in Christchurch, which will no doubt inform the ongoing debate…

• Some of you may have taken part in a recent industry survey about **existing pedestrian planning and design guidance** in NZ (some of it nearly ten years old). The feedback has now been collated and a gap analysis was presented to AMIG, as a forerunner to developing updated industry guidance. There are several "quick wins" to update existing material (e.g. referring to current NZTA processes, linking to CNG info on shared paths), but some things may require a bit more investigation (e.g. testing new monitoring technology, developing new level of service metrics).

• NZTA are developing specifications for the **design, construction & maintenance of walking/cycling facilities on State Highways**. The draft version is focusing on things like shoulder widths, surfacing treatments and maintenance standards. This will be particularly relevant for those SH sections designated as key walking/cycling routes (e.g. Heartland Rides or part of Te Araroa walking path). It is hoped that the final specs can also serve as a model for other RCAs to use for their walking/cycling networks.

• **Public e-scooter sharing schemes** look set to hit our shores very soon, in Auckland and Christchurch at least. There was some discussion around developing codes of practice, covering things like placement of unused scooters, geofencing to limit their location, and user behaviour (especially on footpaths). Watch this space…

• The tricky issue of how to deal with merges from **off-road to on-road cycle facilities** (e.g. approaching some intersections) was debated in detail. Various combinations of sharrow markings and green stripes are the favoured approach; NZTA will work on some revised layouts.



• Finally, this meeting was the last one for NZTA stalwart **Richard Bean**, who is retiring soon. Richard has played a key role in assessing numerous signs, markings and other treatments trialled over the years, and the AMIG Group has always enjoyed his gruff humour. Enjoy retirement, Richard…

If you want to know more about this and previous AMIG meetings, check out the group's webpage here

The next AMIG meeting will be at the end of November in Auckland and will also feature a tour of some of the recent walking/cycling developments in the City of Sails. If you would like to attend, or at least be part of the ongoing email discussion group, contact co-convenors Wayne Newman (RCA Forum; wayne@cresmere.co.nz) or Gerry Dance (NZTA; Gerry.Dance@nzta.govt.nz).

And even if you can't attend AMIG yourself, I am always happy to raise on your behalf any ideas or issues regarding walking or cycling treatments that you would like to see discussed.

***Glen Koorey (Trptn Group AMIG rep)***
***ViaStrada Ltd (glen@viastrada.nz, ph.027-739-6905)***

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BusinessNZ

# Hundreds of shared electric scooters proposed for Christchurch, Auckland

Hordes of shared electric scooters may soon be whizzing around New Zealand's two largest cities at speeds of up to 27kmh – close to the speed limit for much of central Christchurch. You'll have to be 18 to use them, can ride them on the footpath and do not need to wear a helmet.

United States bike and scooter share company Lime, formerly LimeBike, has applied to the Christchurch City Council for a permit to operate 700 e-scooters in the city for a three-month trial starting mid-September.

Councillors voted recently to grant the permit, noting Lime has imminent plans to roll out the scooters in Christchurch and Auckland. If the trial goes well, Lime, which was founded in January 2017 in California, plans to double the number of scooters in Christchurch.

Lime's scooters have a 48 kilometre range and a top speed of 27kmh. Users find, unlock and pay for them using an app. The dockless system means people can leave them at their destination.

Because they have a 300 Watt motor, the scooters fit the classification of a wheeled recreational device, which can be used on a footpath without requiring a helmet, according to NZ Transport Agency rules.

Lime currently operates in more than 80 places around the world. It claims its network of electric bikes, electric scooters and pedal bikes have provided more than six million rides.

Councillor Deon Swiggs called the Lime proposal innovative and said the company was taking all the risk.

"It does fit in with the idea of Christchurch as a city where we can try things."

However, Swiggs questioned the target market for the scooters given they were restricted to people aged 18 and over. He had some concerns about safety and how users' data might be utilised.

"There has to be some consideration about the speed of these things, and knowing there may be conflict where people are walking. That needs to be addressed one way or the other."

Lime's proposal said it would collect and charge the scooters overnight to make sure they were ready to go for the next day, reducing the risk of dumping.

Cr Vicki Buck said: "Transport options that are clean and easy for people are always good. I think this one has an element of novelty about it as well."

Council strategy and transformation general manager Brendan Anstiss said similar schemes worked well with public transport by offering a way to take the first or last part of a trip. He said the council permit would ensure the scooters met safety requirements, and specify how many were on the streets.

"They also offer residents and visitors a fun and active way to get around," he said.

The move comes while a replacement for Christchurch's bike share scheme remains in limbo, with current operator Christchurch Bike Share to start pulling stands off the road from mid-September.

The council is still negotiating with its preferred operator, believed to be Mobike, a Chinese company that helped drive the global bike share boom.

*Source: Stuff*

# Transportation Engineering Postgraduate Courses 2018

## Dept of Civil & Natural Resources Engineering University of Canterbury

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The courses below are available for full-time or part-time students studying for the following postgraduate transportation qualifications at Canterbury:

- Certificate of Proficiency (COP) ~ for individual one-off courses (great for CPD!)
- Postgraduate Certificate in Engineering (PGCertEng) ~ typically four courses
- Master of Engineering Studies (MEngSt) ~ typically eight courses
- Master of Engineering in Transportation (MET) ~ up to six courses plus research project or thesis

Please see the website of the University of Canterbury for fees per course in 2018:
http://www.canterbury.ac.nz/courseinfo/MyGetCourses.aspx?course=&year=2018

*All courses run in "block mode" to enable part-time and distance students to easily take part. In 2018, the contact time will be four days (i.e. a 2-day block of 2 blocks), and students taking the courses will be expected to do more reading and learning in their own time.*
*All prospective students must apply to enrol in courses no later than one week prior to the course starting (preferably earlier), otherwise late fees may apply.*
*Candidates with a Bachelor of Engineering OR other relevant degrees (e.g. planning, geography, psychology, maths), OR non-degree qualification and suitable work experience, will be considered for entry.*

| COURSE | DESCRIPTION (see flyers on website for more details) |
|---|---|
| **Semester 1** | |
| **ENTR 401: Fundamentals of Transport Engineering** *(Self-study course, with 1-day tutorial)* | Bridging course for non-transportation students: Transportation planning; Road link theory & design; Intersection analysis & design; Traffic studies; Accident reduction; Sustainable transport planning & design; Intro to pavement design. Course coordinator: Dr Kun Xie |
| **ENTR615: Transport Network Modelling** *(Block dates: 5-6 Mar, 7-8 May)* | Advanced concepts of macro-, meso-, micro-scopic traffic models; Applications of Bayesian estimation techniques for real-time traffic monitoring; Microscopic simulation package (AIMSUN); Model calibration and validation using heuristic optimization techniques. Course coordinator: Assoc. Prof. Dong Ngoduy |
| **ENTR614: Planning & Design of Sustainable Transport** *(Block dates: 19-20 Mar, 21-22 May)* | Pedestrian planning & design; Planning & design for cycling; Audits/reviews of walking & cycling; Planning & design of bus public transport facilities; Travel behaviour change & travel plans. Course coordinator: Dr Diana Kusumastuti |
| **Semester 2** | |
| **Traffic Management and Monitoring** *(Block dates: 23-24 Jul, 17-18 Sep)* | Introduction to control theory; Implementation of control theory in traffic control; Large-scale urban network modelling and control; Application of microscopic simulation AIMSUN, Macroscopic or Network Fundamental Diagram; Introduction to motorway control: ramp metering, variable speed limit; Coordinated urban network control, traffic signal design (TRANSYT), traffic state estimation. Course co-ordinator: Dr Mehdi Keyvan-Ekbatani |
| **ENTR604: Road Asset Management** *(Block dates: 30-31 Jul, 01-02 Oct)* | Road asset management concepts, levels and functions; Data requirements; Evaluation of functional and structural performance; Intervention criteria; Deterioration models; Rehabilitation and maintenance strategies and priorities. Course coordinator: Assoc. Prof. Mofreh Saleh |
| **ENTR617: Traffic Network Modelling & Optimization** *(Block dates: 13-14 Aug, 24-25 Sep* | Principles of transport network modelling: user equilibrium and system optimum; Basic concept of linear programming and optimization; Traffic Network Assignment package (SATURN); Optimal signal control designs in SATURN. Course coordinator: Assoc. Prof. Dong Ngoduy |
| **ENTR616: Transport Planning and Modelling** *(Block dates: 20-21 Aug, 15-16 Oct)* | Urban transport planning models; Geographic information systems; Travel demand modelling and prediction; Project appraisal; Transport modelling. Course coordinator: Dr Diana Kusumastuti |

*Note: Other relevant courses at the University of Canterbury, University of Auckland or elsewhere may also be suitable for credit to a PGCertEng, MEngSt or MET (contact Assoc. Prof. Saleh for approval).*
For more details contact:
**Associate Professor Mofreh Saleh** (Ph. 03 369 5118; Email: mofreh.saleh@canterbury.ac.nz)
Or visit the website: **www.met.canterbury.ac.nz**

# Photo Competition

It started with the 'fork in the road'. Some common sayings manifesting literally out on the street. And if you look hard enough, there are heaps of them. Seen any othes? Send photos to:
daniel.newcombe@at.govt.nz

**Zebra crossing**

**Fork in the road**


**All roads lead to Rome**


*Figure 1: A Harcourts office in a new development on the city centre fringe (image: author)*

# Get on yer bike! But then what to do with it when you get THERE?

***By John Lieswyn***

Bikes aren't just for the weekend anymore – more and more people are using them to get from A to B. Research for the NZ Transport Agency [1] confirmed that Kiwis are no different from people in other countries in terms of shopping and travel modes – people on bikes spend less per visit but shop more often, resulting in a higher spend at local businesses over time [2, 3].

Unfortunately, location B often doesn't have adequate (or any) means to secure one's bicycle. The provision of cycle stands is spotty all across New Zealand's urban areas. The lack of certainty of secure parking and/or fear of theft is consistently listed in surveys as a significant deterrent to cycling [4-6]

Christchurch has one of the best sets of planning rules requiring cycle parking in the country – Appendix 7.5.2 is available here

Even so, brand-new developments are being built with no space at all for bikes – not even a tree or post to lock to (Figure 1). The one place that might work for visitor cycle parking would inconvenience motorist visitors and potentially damage a bicycle, so the property owner erects a discouraging sign. The assumption seems to be that people on bikes are not customers. About 1km away from the commercial development illustrated in Figure 1 is the polar opposite – a spacious footpath with 'art' stands of adequate height and length accompanied by a bicycle repair station (Figure 2) welcomes people on bikes.

*Figure 2: 'art' stands, repair stand & tyre pump (image: author)*

Portland, USA is often cited as an example of multi-modalism in a car-dominated culture similar to New Zealand's. In Portland (USA), strategic, developments and transportation planners are working with architects, advocates, and neighbourhood associations to revamp nearly 20-year-old bicycle parking rules [7]. The city is aligning bicycle parking to support the aim of achieving a 25% bicycle mode split for all trips by 2030 (and 25% of commute trips by 2035). This stands in sharp contrast to recent district plan reviews in Hutt City and Palmerston North, where the parking requirement is based on historic proportions of cycling mode share [8].

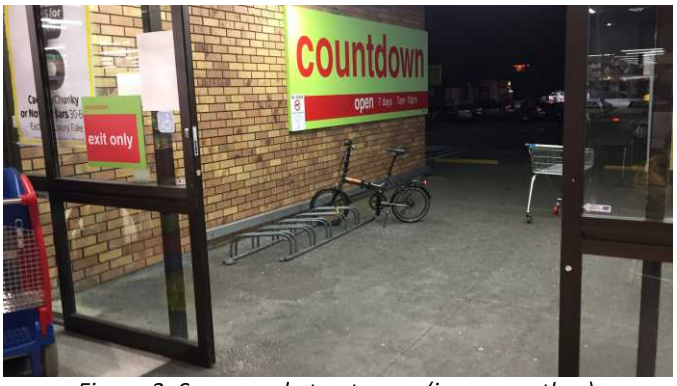


*Figure 3: Supermarket entrance (image: author)*

Interestingly, KP Property (owners of the Plaza, a large format retail development in Palmerston North) submitted to the district plan review in opposition to proposed strengthened cycle parking requirements.


*Figure 4: Front entrance (image: Google)*

They felt locating bicycle parking within 50m of a main pedestrian entrance is too hard because "…parking areas serving these activities are relatively large, and on top of the provision for required accessible spaces, parent parks and trolley bays, a cycle facility within 50m of a main pedestrian entrance will be difficult to adhere to" (ibid).

Apparently KP hasn't noticed that they already have a bicycle parking facility 2m from the front door – it is just that the stand doesn't support bicycles adequately or allow secure locking of the frame (Figure 3). A better stand is right next to the front door on the other side of the Plaza (Figure 4).

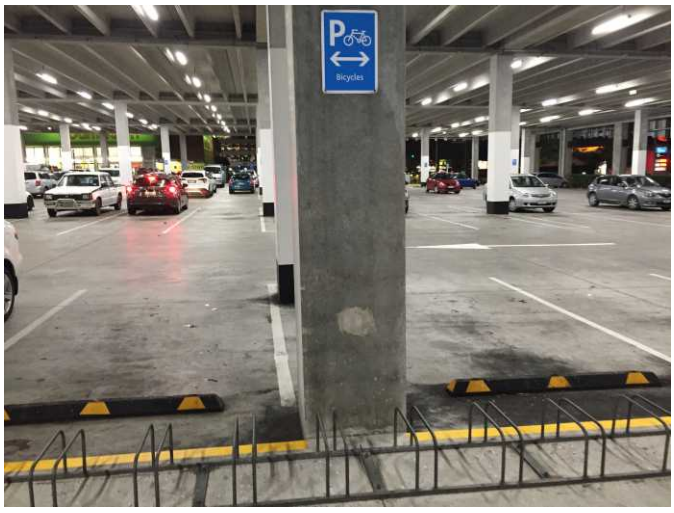


*Figure 5: Parking garage bike stand (image: author)*

Within the parking garage adjacent to the south main entrance of the same mall, another bike stand (Figure 5) is provided next to a glossy row of Tesla EV chargers (Figure 6). Unlike the Tesla parking which can be found on an app, the bike stand is not easily found unless you know it is there – people on bikes typically look for parking near the entrance.

*Figure 6: Parking garage EV charging (image: author)*

All too often the refrain from local authorities is along the lines of "there is no national standard we can point to" and/or "businesses don't believe their customers arrive by bike". With the advent of organisations like Bikes Welcome and the plethora of good design guides available in any quick internet search, there is no excuse for bad (or no) cycle parking.

Hopefully, we will soon have a national best-practice guide as well.

*John Lieswyn is a Principal Transport Planner at ViaStrada, Ltd in Christchurch. He is a board member of Bikes Welcome, a New Zealand based organisation whose mission is: "Growing everyday cycling by helping businesses recognise, value and support their bike using customers". https://www.bikeswelcome.org/*

***References***

*1. Fleming, T., S. Turner, and L. Tarjomi, 2013. Research report 530: Reallocation of road space, NZ Transport Agency. Available from: http://www.nzta.govt.nz/resources/research/reports/530/docs/RR-530-Reallocation-of-road-space.pdf.*
*2. Jiao, J., A.V. Moudon, and A. Drewnowski, Grocery Shopping: How Individuals and Built Environments Influence Travel Mode Choice. Transportation Research Record: Journal of the Transportation Research Board, 2011. 2230: p. 85-95.*
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*4. Hunt, J.D. and J.E. Abraham, 2007, Influences on Bicycle Use, Springer. p. pp 453-470.*
*5. Research New Zealand, 2016. Baseline Survey of New Zealanders' Attitudes and Behaviours towards Cycling in Urban Settings, N.T. Agency. Available from: http://www.nzta.govt.nz/assets/Walking-Cycling-and-Public-Transport/docs/NZTA-Attitudes-and-perceptions-of-urban-cycling-full-report-14-12-16.*
*6. Buehler, R., Determinants of bicycle commuting in the Washington, DC region: The role of bicycle parking, cyclist showers, and free car parking at work. Transportation Research Part D: Transport and Environment, 2012. 17(7): p. 525-531.*
*7. City of Portland, 2018. Bicycle Parking: An Update to Portland's Bicycle Parking Zoning Code - Discussion Review Draft. Available from: https://www.portlandoregon.gov/transportation/article/694202?utm_medium=email&utm_source=govdelivery.*
*8. Palmerston North City Council, 2018. Submissions 32-35 on Palmerston North District Plan Change 22E Available from: https://www.pncc.govt.nz/media/3131024/pc22a-g-submissions-32-35.pdf.*

# Branch updates

TRANSPORTATION GROUP NEW ZEALAND

**Auckland/Northland Branch**

Our annual Quiz was held on the 15 August. Around 80 people attended with representation from many consultants and a client or two. Congratulations to the winning team knocking off the inaugural champions! Enjoy your $100 bar tab prize.

Last week Kathryn King presented on the Auckland Transport 10 year Cycling Programme. She spoke about the ambition programme of the largest investment in walking and cycling in New Zealand. A copy of the slide will be added to the Transportation Group website shortly.

No upcoming events confirmed. Keep an eye out on the website and emails, or let me know if you have a great idea for a presentation.

**Waikato/Bay of Plenty Branch**

The Waikato/Bay of Plenty branch held their annual NZPI / ENZ Transport Group joint quiz at the end of August, which was attended by nearly 60 members. 9 teams battled against each other over a couple of hours, sustained by nibbles, drinks and pizzas.

The top 3 teams were neck and neck until the last round, when the team "I thought this was speed dating" (Tauranga City Council) pulled ahead by two points to win.

Second prize was a tie break, but "E= MC Hammer" (HG & others) manage to hit the nail on the head with the exact answer to the 'nearest answer question', so narrowly beating "I'm Smarticus" (Opus & others). It was a fun social night, with a great mix of planners and transport professionals from the public and private sectors.

Thank you to Beca for hosting and to the committee members for organising, the level of interest was really encouraging – it's fast becoming the mid-year social event in the region. We may need to invest in a trophy for next year!

**Central Branch**

The Central Branch committee continue their hard work in organising the Transportation Group Conference 2019. The committee has received a number of abstracts. The deadline for submitting the abstracts has been extended to 13th September. Over the next month, the committee will be busy reviewing these abstracts and formulating the programme for the 2019 TG Conference.

***Upcoming event***

Lunchtime seminar - "Getting confused at a higher level" – lessons from summer school in the Netherlands

The University of Amsterdam offers an excellent summer school programme called 'Planning a Cycling City'. It takes an 'auto-ethnographic' approach to learning about mobility which helps participants gain a deeper, and more diverse understanding of cycling in Amsterdam. Thanks to a study grant from the Transportation Group, Claire Pascoe attended this year and was determined to not bring home a series of enviable cycling infrastructure photos that simply resulted in the commonly heard cry "But we're not Amsterdam!". Indeed, we're not, but through an experiential and reflective learning opportunity, there were still some gems to bring home.

An email notification for this event will be sent to all TG Central Branch members.

When: Wednesday, 26 September 2018
12.00pm arrival for networking and light lunch. Presentation and Q&A 12.30pm – 1.30pm
Where: To be advertised via email soon.

**Canterbury-West Coast Branch**

It's been a good few months with a variety of different events both happening and coming up.

The quiz night was (again) a resounding success, with the team from Viastrada taking the trophy home.

# Branch updates

TRANSPORTATION GROUP NEW ZEALAND

The Lucy Saunders Healthy Streets workshop came and went and was attended by a good mix of public and private transport professionals, as well as other key stakeholders. Her separate presentations to the public and local mayors, councillors, commissioners and other key decision makers both were big hits with over 150 from the public and 60 decision makers attending. The Public Hui was complemented by Jeanette Ward and Jillian Frater who shared their papers from the 2 Walk and Cycle conference, as well as a panel to discuss questions brought by the audience. Big thanks to all involved, especially Lucy for coming all this way on her own time.

This month we've got two more events coming up:

An event in conjunction with Pecha Kucha and the New Zealand Institute of Architects for the Festival of Architecture. These events are done in an attention-grabbing and speedy style, to an audience with a wide variety of backgrounds and demographics.

A networking event with the Planning Institute, Institute of Landscape Architects and Resource Management Law Association. Hosted in Botanic in the Terraces, this will be a fun way to see the still-developing precinct, meet some new people and share a drink with some you already know. RSVP to Ruth.Hudson@ccc.govt.nz ASAP if you haven't already.

The Branch is also trying a new way of communicating it's events. We'll be trialling upcoming events emails at the end of the month to complement the Roundabout Branch updates. This will mean you won't receive the last minute reminders anymore, so if you see an event you're interested in, don't hesitate to sign up and put it in your calendar!

**Southern Branch**

The Southern branch have an event coming up this month.

Title: Accelerating uptake of electric vehicles for a low carbon economy
Presenter: Henrik Moller, author of Flip the Fleet
Date: 5pm, Thursday 27 September 2018
Venue: Plaza conference room, Dunedin City Council, the Octagon, Dunedin

**NZ Modelling User Group**

· Conference is on Monday / Tuesday next week at the Grand Millennium in Auckland;
· AGM is on Tuesday at 12pm; and
· NZMUGS funded scoping exercises for modelling guidelines ($6k each) are progressing and initial results will be presented at the conference. In the longer term these will be referred to NZTA to progress via TB. Remember if you are a Transportation Group member, it is free to join NZMUGs. All you need to do is email tech.groups@engineeringnz.org and ask to sign up.

**Signal Network User Group**

- Committee will be meeting in early October
- SNUG Nov 2018 Annual Workshop Coming up in November.
- Tickets to the SNUG Nov 2018 Annual Workshop are now available. Earlybird tickets are available until October.

We will be calling for papers shortly, and be making the programme available after that. The annual SNUG workshop is a great chance to get together with other people who work in the signals industry.

Please make sure you pay on time. Credit Card payment is the preferred method of payment for the SNUG committee. If you pay by invoice, please pay on time so we don't have to chase you up. The members of the SNUG committee are all volunteers, we don't want to spend our time chasing your accounts team for payment. We look forward to seeing you in Hamilton.

Remember if you are a Transportation Group member, it is also free to join SNUG. All you need to do is email tech.groups@engineeringnz.org and ask to sign up.

*A handy bridge in Danang, Vietnam*

# Roundabout of the month

This edition how could it be anything other than the award-winning Hemo roundabout in Rotorua. This $8.1 million roundabout at the junction of State Highway 5/State Highway 30 won the Connecting Communities Award at the recent Golden Foot Walking Awards.

Seen a better pic? Email: daniel.newcombe@at.govt.nz

# Caption competition


This edition's caption competition is hot stuff. A caption has been suggested. If you have a better suggestion, send it to daniel.newcombe@at.govt.nz

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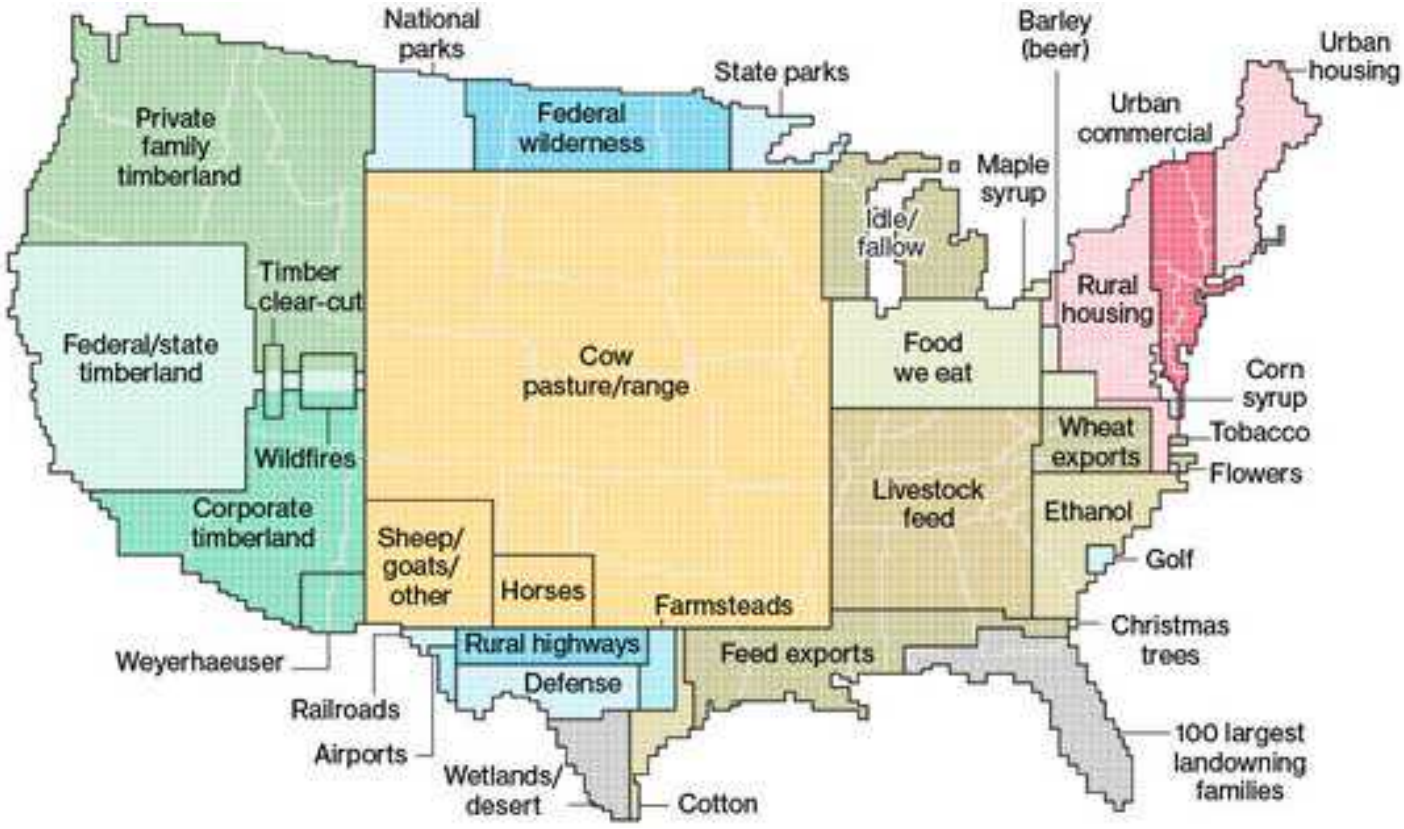
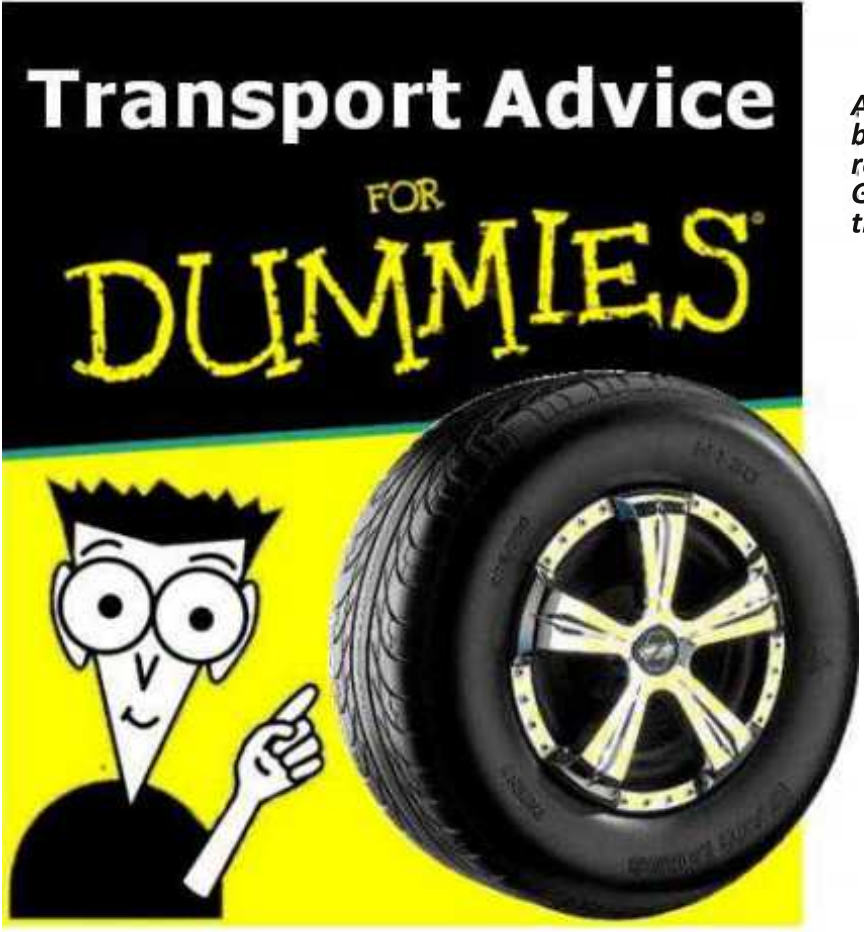



*A visualisation of the spatial allocation of various land uses in the US.*




***A tongue-in-cheek column on transport matters by The Transport Guy. The contents do not represent the views of the Transportation Group NZ, Engineering NZ, or anyone else for that matter. Follow the advice at your own risk.***

**Dear Transport Guy**

People are getting really pissed off at having to pay higher fuel prices due to extra taxes. It costs more and more to fill up the car and its all going on buses and trains that I'll never use. Its not fair!

**Teresa, Albany**

**Dear Tedious**

You are quite right. Higher fuel prices make people think twice about how much they drive. That surely can't be good. It's just a shame that people don't want to fund necessary transport projects through other means - rates, tolls, congestion charges - so it looks like high fuel prices will continue. At least if you get priced out of using your car, you can take advantage of those alternative modes you helped pay for. Its almost like someone was looking out for you.

**~Transport Guy**

**Dear Transport Guy**

The government has announced a gazillion dollars towards safety improvements.

But as a society we seem unwilling to contemplate even the simplest measures to actually improve safety - lower speed limits, actually observing those speed limits, speed limiters on cars to force people to observe the speed limits...

We'll just put in more barriers and smooth out some sharp curves, but it will just allow for higher speeds and a bit more leeway when speeding drivers crash.

Pedestrians and cyclists will still get struck by distracted drivers checking their phones. Kids will still be driven to the nearby school because it is 'too dangerous' for them to walk.

Busy roads will still cause a severance within communities. Travel time savings will still outweigh safety improvements in economic analyses.


Won't the massive new 'safety' investment be wasted if we can't really accept that the way to reduce the road 'toll' is to substantially reduce speeds?

**David, Palmerston North**

**Dear Depraved**

Yes.

**~Transport Guy**

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Do you have a dumb question for Transport Guy? Email it to:
transportfordummies@gmail.com and he'll do his best to answer...

# Group Contact Details


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# Kids explain traffic engineering

"How wide should footpaths be?
Wide enough to ride side by side
with your friends."