



Leaf battery trouble dents trade

Sales of the Nissan Leaf have taken a hit after allegations of 30kWh battery degradation were revealed in a Flip the Fleet report and subsequent publicity.

The report and related media stories have contributed to a drop in interest from potential Leaf 30kWh customers – even Leafs in general, some dealers say.

Those contacted by *EVtalk* were reluctant to use their names. But some say the 30kWh issue has come as part of a triple hit to the industry.

That includes the discovery of stink bugs on some car import ships and the Lyttleton Port strike – more action is expected from April 20-25 – which have delayed the arrival of many imported vehicles such as the Leaf.

Even though the Leaf 24kWh and 40kWh models are unaffected by the battery allegations, dealers we've spoken to say Leaf enquiries have declined.

Industry statements on the battery matter are expected soon and dealers say anything that resolves the issue would be welcome.

A joint statement from the Ministry of Transport, the New Zealand Automobile Association and others on the Government's EV programme leadership group is expected any day.

But they are expected to leave the issue mainly to Nissan, which is doing its own internal investigation.

EV leadership group chairman and MOT chief executive **Peter Mersi** says



the ministry is aware of the situation with the 30kWh Leaf and the work Flip the Fleet did.

"We received notification from them prior to them releasing their report."

Mersi says it's primarily an issue for Nissan to address.

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New Zealand's cheapest new plug-in

Toyota New Zealand has launched the cheapest new plug-in vehicle available on the market – its Prius Prime model.

A single version is available at \$48,490 drive-away, \$5500 less than the retail price of a Hyundai Ioniq plug-in hybrid.

Toyota claims a 63km range and a speed of up to 135kmh. The RightCar listing for the vehicle gives it a fuel consumption of 1 litre/100km and a CO₂ rating of just 22gm/km, against the fleet average for New Zealand.

Toyota staff indicated testing around Palmerston North showed that exceeding a range of 50km in normal use is possible.

The battery is an 8.8kWh lithium ion unit, twice the size of the existing used import Prius plug-in.

The charging lead is type two and, on a standard socket, it will take 4.5 hours to charge at a RightCar-rated cost of 91 cents. Toyota also offers BYO cable public charging for around \$600 and, at 16 amps, the car will fully charge in one hour and 50 minutes.

The battery features a warming system for optimum efficiency.

There are a range of drive modes, with the main electric setting being "EV City" which works for maximum electric-only driving.

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EVtalk

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8/152 Quay Street, Limited.
P.O. Box 10 50 10,
Auckland City, 1030.
Ph. 09 309 2444.

EDITOR

Geoff Dobson
geoff@automediagroup.com.au
021 881 823

GROUP EDITOR AUTO TRADE TITLES

Scott Morgan
021 240 2402
scott@automediagroup.co.nz

BUSINESS MANAGER

Rachel Hadfield
021 778 745
rachel@automediagroup.co.nz

PUBLISHER

Vern Whitehead
021 831 153
vern@automediagroup.co.nz

MANAGING EDITOR

Richard Edwards
021 556 655
richard@automediagroup.co.nz

GENERAL MANAGER

Deborah Baxter
027 530 5016
deborah@automediagroup.co.nz

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**DRIVE
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WEL, WEL! Fast-charging the Waikato

When the first of WEL Networks' bright blue slim-line electric vehicle fast-charger boxes sprouted around the Waikato, people said they boosted the region's reputation as a centre of growth, opportunity and innovation.

They're right.

But the free charging stations are more than that.

They are also the start of a WEL Networks' regionwide rollout remedy for "range anxiety", a recognised condition that afflicts EV drivers.

Its symptoms aren't so different from the sweaty palms and accelerated heart rate of a petrol or diesel vehicle driver when the fuel gauge needle hovers just above "empty". But there the comparison ends.

Petrol stations are everywhere. If the worst happens, there's always the gas can and that universally recognised SOS, the hitchhiker's thumb.

"Fast-chargers give electric vehicle drivers comfort," WEL Networks assets management manager **Paul Blue** says.

"The Waikato is one of the fastest growing regions in New Zealand and we need to provide our communities with innovative energy solutions that will support this growth."

The distinctive fast-chargers have been installed across the region from Raglan to the Hamilton city centre and Te Kauwhata.

Blue (no, the charger colour isn't in his honour) says their numbers will increase as EV popularity grows in the Waikato.

The WEL chargers can be found on the international electric network app Plug Share, a free device for EV owners which provides real-time information on where to find chargers throughout the world.

Blue is in no doubt EVs will dominate on Waikato roads sooner rather than later.

"It may not look like they are coming fast but they are," he says.

"In 2015, there were 900 EVs in the



Charging up in Caro St, Hamilton.

country. By mid-2017 there were 5000. By 2030 you won't be able to buy a new Audi, BMW or Mercedes car that has a petrol or diesel engine. In the UK in 2040 you won't be allowed to buy a petrol or diesel vehicle from anyone.

"The arrival of the electric vehicle is not an 'if', it's a 'when'."

As Blue says, in the New Zealand context EVs are not just a great use of renewable energy, they marry up perfectly with this country's 80% energy source – renewable electricity.

"Electricity and electric vehicles is a really good news story for New Zealand. It means we are no longer dependent to the same level we were on oil-producing countries. We are independent of them.

"This is good for the stability of the country. It's good because profits made in New Zealand stay in New Zealand. Electricity companies are predominantly owned by New Zealanders."

Range anxiety will disappear as car manufacturers improve the capability of cars, Blue says.

"It's very fast-moving technology which every manufacturer of cars is

looking at."

Providing for mass EV use is high on the list of new technology-driven challenges facing Waikato community-owned WEL Networks, whose sole shareholder is the WEL Energy Trust.

As the region's only electricity lines provider, WEL Networks is front-footing the challenges laid down by fast-moving changes in household technology use and demand. It is also meeting the demands of a growth explosion in the Waikato business sector.

Blue anticipates the galloping pace of change will result in WEL Networks building a much closer, and more active, connection with its nearly 90,000 customers.

In the past, because of the structure of the power industry, Waikato people's contact with the electricity industry had mostly been through electricity retailers.

But with the uptake of the electric car, the community's increasing adoption of electrically charged batteries (in cars and homes) and growing dependence on electricity provision 24/7 ensures WEL Networks will become "WEL" known, he says. ■

Mevo is on the move

Wellington-based electric car-sharing start-up Mevo is expanding.

It's not only increasing the number of EVs in its Audi A3 e-tron fleet but has set its sights on moving into five cities across New Zealand and Australia within five years.

Founding director and chief executive officer Erik Zydervelt plans to grow Mevo's fleet to 50 EVs by the end of the year and 2000 within the five-year time frame.

"We're on track," he says.

"In our first full year, we grew the fleet five-fold, starting with three cars and growing to 15."

Conversations with stakeholders in Melbourne, Sydney and Brisbane are continuing apace and Mevo hopes to soon establish in both Lower Hutt and Auckland.

Mevo – a play on the word "move" – was founded in December 2016 by Nelson-raised friends Zydervelt and **Finn Lawrence.**

Zydervelt trained as an "urbanist" – a specialist in researching city systems. He worked in urban research and systems before moving into corporate strategy.

Lawrence studied mechatronics, which combines electronics and mechanical engineering, and had worked in start-ups and business.

Swapping travel stories one day the friends found themselves on the topic of car sharing, which they had both seen work well abroad.

They saw an opportunity for electric car sharing to create a more sustainable, environmentally friendly transport network for Wellington, and offer an alternative to personal car ownership for both urban residents and businesses. So they combined their talents to start Mevo.

"Cars are a huge cost for businesses and individuals," Zydervelt says.

Carbon reduction is also a benefit. Mevo offsets its "lifecycle": carbon emissions from the vehicle manufacturing process, energy generation and the small amount of fuel used in its plug-hybrids by 120%.

Every car-share takes about seven to

Mevo's Erik Zydervelt, left, and Finn Lawrence.



"One member told us he spends less on a Mevo than he used to spend on parking alone."

11 private vehicles off the road, he says.

"We believe that business should be regenerative and also buy carbon credits from Ekos's project in the South Island."

Mevo has received backing from several quarters. Wellington City Council, for instance, has allowed Mevo to use central business district carparks (mostly now allocated) and in the suburbs, many of which are combined with EV charging.

Z Energy has invested \$250,000 in Mevo and the Energy Efficiency and Conservation Authority (EECA) has provided two matched grants through its low emission vehicles contestable fund.

One EECA grant of up to \$500,000 provides for a fleet of 50 electric cars and 64 kerbside chargers to go with Mevo "pods" or customer pick-up points.

That support helps show mobility-as-a-service (MaaS) is quickly gaining support in cities worldwide, Zydervelt says.

"Car-sharing services are growing in popularity because they are cheaper than owning a vehicle and electric cars offer the other benefit of a green, low-emissions choice."

"One member told us he spends less on a Mevo than he used to spend on parking alone."

Zydervelt says members can also

drive a new luxury electric car without having to worry about parking, getting a warrant and registration, depreciation and the other costs involved in owning a car. And they don't have to clean it.

Private car ownership involves having a car sit around for much of the time, he says.

Eventually, Zydervelt hopes to see the fleet move into self-driving EVs when appropriate.

So how does Mevo work?

Membership starts at \$50 a year. Using a smartphone app, members can book, lock and unlock a Mevo EV and drive the car from designated pods, usually with a charging station.

Three tiers of membership are available, for those intending to use a Mevo car a few times a year to those who use it weekly. Hourly rates vary between \$11 and \$23, depending on the membership plan.

Electricity, any fuel needed for longer trips, maintenance, insurance and mileage (up to 200km a day) are all included in the price.

Most trips require the driver to bring the car back to the pod it was taken from.

But Mevo is trialling a one-way service between central Wellington and the airport, for example. As the service grows, other A to B points are likely to be introduced.

And with car-sharing gaining popularity here and overseas, it looks as if Mevo is in the driver's seat.

Visit www.mevo.co.nz for more information. ■

EVs marching on, Sexton says

Californian EVangelist **Chelsea Sexton** has noticed big advances in New Zealand's EV world since her last Leading the Charge tour in 2016.

"The sheer volume of vehicles (from just over 1000 then to 7233 EVs and hybrids now), and the proliferation of charging stations" are among them, she says.

Sexton was along for the entire nearly 6000km Leading the Charge EV road trip organised by the Better NZ Trust.

It began in Bluff on March 14 and finished in Cape Reinga on April 3, taking in most parts of the country.

About eight EVs made the full trip, joined along sections of the journey by many others.

EV advocate **Mark Nixon** of Christchurch drove one from Bluff to Hamilton, for instance.

"It was a great adventure," Sexton says after being chauffeured most of the way by the Better NZ Trust trustee **Sean Dick** in his Tesla Model S.

Sexton says she finds New Zealanders more accepting of EVs this time around.

"They're no longer the novelty that they were a couple of years ago. People are not so cautious and many did try out EVs at the stopovers."

She heard from people who came to previous EV events she was involved with who have since obtained EVs.

"Some have electric bikes too."

Sexton was in New Zealand in July and August last year to address various events, and has also been here to promote films she's had a hand in, such as the



Chelsea Sexton

2006 documentary *Who Killed the Electric Car?*

Fittingly, she was able to address a gathering for the follow-up *Revenge of the Electric Car* during the road trip's Whanganui stop.

A consulting producer for

different EVs anyway."

As she heads back to the United States, Sexton is expecting a fight between the Californian state government and the federal Environmental Protection Agency over its possible adoption of less

stringent emissions targets.

US president **Donald Trump's** protectionist views are well known, and in his bid to shore up US businesses there's the likelihood of a trade stoush between the US and China.

That could impact on EV makers like Tesla. The California electric automaker doubled its sales to more than US\$2 billion in China last year, but talk of China applying extra tariffs on US goods could prove a major setback.

Tesla is negotiating to assemble cars in China, another project at possible risk.

Sexton says all that could impact on EV availability in other countries such as Norway and England.

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Chelsea Sexton checks out the French students' electric campervan.

that film, Sexton hosted a question-and-answer session with filmgoers. Proceeds from the event went to Whanganui Green Bikes.

A third film dubbed *Generation EV* is on the cards.

Sexton says she still hasn't got an EV herself back in California.

"I don't drive very much as I can walk or take public transport. Also, I drive a lot of

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Christchurch gets its own EV City

Canterbury's electric and hybrid vehicle specialist store EV City officially opened on April 6.

Former Christchurch mayor and current councillor **Vicki Buck** declared EV City's showroom open at 158 Wordsworth St in Sydenham, Christchurch.

"This is fantastic – I love it," Nissan Leaf owner Buck says.

"Everyone I know who hasn't got an EV says their next one will be electric."

Owner and EV specialist **David Boot** welcomed 210 people and thanked all who had supported the project.

Special guests also included National Party education spokeswoman **Nikki Kaye** and French students **Heloise de Bokay** and **Solene Trinquet** who are touring New Zealand in a Jucy prototype electric campervan.

Kaye sees EVs as the future, particularly as many young people she has come across are "passionate about the environment".

A variety of all-electric and hybrid cars were displayed – the 580 square metre showroom is able to fit 28 comfortably. And a 1903 electric car was on show for the opening.

Boot says many of the EVs arrived just in time after de-



lays because of the stink bug issue and industrial action at the Lyttelton Port.

His range includes Nissan Leafs and e-NV200 vans, hybrid Mazdas, Nissan Note e-Power hybrids and plug-in Toyota Prius hybrids.

Boot says the vehicles will be sold "ready to go". Customer's wants will be taken into consideration and the vehicles come with all the appropriate documentation, as well as guarantees and warranties.

A charging comparator shows the different styles of charging.

Electric bikes from Watt Wheels will also be available.

Two 22kW Rolec chargers with two types of outlets outside the showroom are

free for customers to use.

"These will also be available Friday and Saturday nights for anyone buying a Nissan Leaf or Toyota Prius plug-in hybrid for taxi or Uber purposes," Boot says.

A waiting/lounge area is also available for use by customers.

To add some humour, EV City has produced a few t-shirts with slogans and graphics. One says, "I love (heart graphic) range anxiety", another has a reference to AC/DC charging and a third has an image of a leaf holding binoculars in relation to Leaf Spy.

Boot will be manning the showroom pretty much by himself for the first year and servicing or other work will

be done through nearby EVs Enhanced.

EVworld creators Conferenz sponsorship general manager **Dominic Duncan** spoke at the opening about bringing the EVworld show to Christchurch on November 23 and 24.

That's because of South Island demand for a dedicated show bringing together the full spectrum of electric mobility, cars, e-bikes, e-buses and more, he says.

Christchurch has some very innovative developments going on, with Yoogo car share launched with 100 EVs, the Zephyr electric air-taxi project, autonomous vehicle trials and others, Duncan says.

Auckland will also host EVworld on August 10 and 11.

So why establish EV City?

"The Government has called for 64,000 EVs by 2020 but in Christchurch little has happened with private industry not answering the call," Boot says.

"So let's do it!"

Boot says many people tell him EVs are the future.

"But this is now – not the future."

Search for EV City on Facebook and Instagram or contact David Boot on 0275 768 007. ■

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First truck conversion workshop opens

Waste Management NZ has opened the country's first workshop dedicated to converting diesel trucks into electric vehicles.

The company plans to convert 20 trucks in its national fleet in the next two years.

The first conversion is almost complete and the truck will be used to collect waste from Auckland Hospital.

The workshop, based at the company's head office in Mt Wellington, is also open to other companies looking to transform their vehicles into EVs.

There has been a lot of interest and enquiry from



From left: Energy Efficiency and Conservation Authority chief executive Andrew Caseley, Maungakiekie MP Denise Lee and Waste Management managing director Tom Nickels.

large fleet operators and Waste Management is now in discussions with several.

The workshop is being run by a small team of EV and mechanical engineers.

The team completed a

training programme with Dutch bus and truck electric mobility company EMOSS.

The cost of conversion depends on a number of variables and is not available because of commercial

sensitivity.

The first conversion took around a month but the work time is expected to reduce as more vehicles go through the process.

Waste Management managing director **Tom Nickels** says he's delighted to open the workshop in what is a major step forward for the company and electric vehicles in New Zealand.

"Our investment in the EV workshop will create a knowledge centre for EV conversion in New Zealand and will help us move towards our long-term goal of a fleet of fully electric vehicles.

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EVs marching on, Sexton says

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Meanwhile, she's urging New Zealand to "keep going" towards its EV goals, particularly as most of our electricity comes from renewable sources.

"One of the biggest challenges is inconsistency," she says.

Even during her latest visit, policies seem to keep

changing, she says.

Talk of national and regional fuel taxes could favour EVs and she also believes EVs here could become more affordable, especially with Government support.

The highlights of her latest stay have been many.

"A month has gone by very quickly."

Sexton enjoyed catching up with two French students, **Heloise de Bokay** and **Solene Trinquet**, who are doing a seven-month EV tour of New Zealand in a Jucy prototype electric campervan.

The trio met in Nelson during a Leading the Charge stopover in Richmond.

The students are helping establish links between New Zealand and French schools.

Sexton noticed this year that considerable interest was shown by local schools in the Leading the Charge tour. Still more schools could be involved, something she is keen to see on her next Leading the Charge visit.

"I hope to be back as soon as I can." ■



More power to the pedal

Auckland visitors and residents can check out the city's highlights on an electric bike guided tour.

Power to the Pedal is rated number one on TripAdvisor for bike tours and outdoor activities in central Auckland.

Eddie Jack, an Auckland resident who moved to the city from Scotland in 2002, started the e-bike tour business just over a year ago.

He noticed the city had very few cycle tours, a more common feature in overseas cities.

Jack had enjoyed bike tours in Paris, Sydney and several other major cities where e-bikes were available.

He found it a great way to see the sights "without breaking a sweat".

"I love cycling and getting out and about," Jack says.

In his previous job as a lawyer, he also preferred a quick and easy transport to work.

Getting around Auckland on a conventional bike requires a fair degree of fitness, especially to get up the likes of Mt Eden, he says.

"So e-bikes were a no-brainer for Auckland."

He's watched e-bikes grow in popularity around town.

"You can have a bit of fun and enjoy a casual ride with friends."

Power to the Pedal believes bike tours are best experienced in small groups, so tours are limited to six riders plus a guide.

"We like the idea of engagement and providing a more personal experience so that number is about ideal to handle," Jack says.

It also avoids issues around taking larger groups together through traffic lights and junctions.

Cycle-specific headsets are used so riders can receive commentary and safety instructions from their guide on

the move.

Tours make considerable use of Auckland's award-winning cycleway network and, after extensive research, Power to the Pedal uses a leading United States e-bike brand called Pedego.

Power to the Pedal's longest guided tour covers about 30km of central Auckland. It takes in highlights such as Mt Eden's summit, the Auckland Domain, the waterfront, the Viaduct, Westhaven Marina and more, using



E-bikes are a great way to get around.

cycleways most of the time.

An afternoon tour covering about 16km focuses on historical aspects of the city and takes a loop around Grafton Gully, Karangahape Rd, Ponsonby, Grey Lynn, Herne Bay, Westhaven and the Viaduct.

"It's a bit more off the beaten track," Jack says.

Power to the Pedal also offers a unique evening tour of the city lights, mainly along the waterfront, including a view of the now LED lit Auckland Harbour Bridge, with its lights powered by solar and battery technology.

About 90% of the evening tour is on cycleways and is all on well-lit paths, including Auckland's famous Lightpath, also known as the Pink Path. Lights and high visibility gear are provided.

The pace of each tour group is set by the riders. Jack says fitness is not a key factor as e-bikes provide a measure of equilibrium and enable all riders to maintain a reasonable speed, even for those with longstanding injuries or minor health issues.

Riders' ages can vary from around 14 years to the over 80s.

Briefings are provided before each tour.

Depending on the group's prefer-



Checking out Auckland highlights on a Power to the Pedal tour.

ence, the guided tours can take in some selected stops, perhaps including a coffee break.

"Our guides are 100% local and love to explain what makes Auckland such a fantastic place to live," Jack says.

Photos are sent to remind riders of their tour highlights.

Power to the Pedal rents out e-bikes too, whether for a few hours or a full day.

"We're also finding that locals are taking our e-bikes out on rentals with a view to doing something of an extended test ride - to work out whether they want to buy one," Jack says.

"Safe to say, the usual post-ride feedback is that they do."

"We can give our riders plenty of route suggestions and insider tips, to make the most of their time in the saddle."

Visit www.powertothepedal.com for more information. ■

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It's a matter of courtesy

Electric courtesy cars have begun arriving at the first of 25 automotive workshops around the country.

Sonter Automotive in Christchurch is among the early recipients, along with Papamoa Automotive Service Centre in Tauranga and Goodhue Automotive in Hamilton.

EVincible was given \$263,450 for the courtesy cars in the Energy Efficiency and Conservation Authority (EECA) low emission vehicles contestable fund third round.

The EV consulting and project manager services company is co-ordinating the roll-out of battery electric courtesy cars and associated charging stations.

The cars are mainly Nissan Leafs, EVincible's **Mark Nixon** says.

The project will give workshop customers a chance to test drive an EV.

It will also enable the workshops to increase their familiarity with EVs and develop EV servicing skills through training modules developed by co-applicant AECS Ltd for upskilling automotive workshop technicians.

AECS held the first EV training seminar in Auckland on April 9. Ten more are planned around the country in 2018, some in conjunction with the MTA. Meanwhile, fourth-round EECA fund applications closed on April 11.

Proposals will be evaluated by an independent panel and successful ap-

plicants will be notified once decisions have been made.

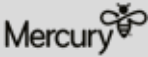
Round five is expected to open in August.

The Government established the fund to support a reduction in carbon emissions by encouraging innovation and investment that accelerates the uptake of electric and other low emission vehicles.

It provides up to \$6 million a year to co-fund - up to 50% - projects with private and public sector partners in areas where commercial returns aren't yet strong enough to justify full private investment.

Visit www.eeca.govt.nz and www.aecs.net.

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Company	Energy Deals	Where	Cost to charge LEAF*
	Plug-in Vehicle Fuel Package 20% discount on your energy bill from 9pm – 7am, available on multiple properties, guaranteed discount for 2 years from signing up to offer, 10% PPD is included in these calculations.	Auckland Wellington Christchurch	\$5.75 \$5.82 \$5.63
	Electric Car Plan Super-low night rates that start at the earlier time of 9pm, until 7am daily. Available for your entire home's electricity needs. Rates are fixed for 3 years and includes 20% PPD. And, join before 31 August 2018 and get a year's worth of free EV charging on us! (bill credit of up to \$300)	Auckland Wellington Christchurch	\$4.91 \$4.15 \$2.80
Contact Energy	Freedom plan: Excellent night rates, no fixed term, 20% PPD has been included, check if the matching daytime kWh rate will affect your overall bill.	Auckland Wellington Christchurch	\$5.86 \$4.89 \$3.41
Ecotricity	Low Solar: Low Usage plan for EVs & can buy back solar energy, no fixed term	Auckland Wellington Christchurch	\$6.17 \$4.50 \$4.53
Electric Kiwi	One Plan with Hour of Power: Free hour of off-peak power daily – included and calculated to be 2 kWh for charging at 8 amps. Note: this could be different depending on your designated Hour of Power.	Auckland Wellington Christchurch	\$6.46 \$6.48 \$6.71
Flick Electric	Wholesale rates plus their Flick Fee: No fixed term, EV rate in Wellington. Calculated using an average spot price of 5.7c per kWh.	Auckland Wellington Christchurch	\$5.79 # \$3.58 # \$4.36 #
Genesis Energy	Classic plan: Excellent night rates, no fixed term, 10% PPD has been included, check if the matching daytime kWh rate will affect your overall bill.	Auckland Wellington Christchurch	\$6.61 \$4.10 \$3.62
Paua to the People	Cheap As Plan with EV night rates: No fixed term. Calculated using an average spot price of 5.7c per kWh	Wellington	\$3.25 #

*Approximate cost for a full charge of a 24kWh LEAF in the 3 largest centres of NZ.

Please note that rates vary around New Zealand – the above costs were from Mt Wellington in Auckland, Northland in Wellington and Linwood in Christchurch. They can also depend on your meter type & the company you use. Prices vary at the different times of the day eg charging during the day may have higher costs. Flick Electric in Christchurch has higher daytime rates in Winter due to variable pricing from the lines company. The rates we have used above are calculated each month using a low user cost, overnight rates, includes 10% charging loss, prompt payment discounts (PPD) if available and GST, excludes daily charge. Please note that prices were correct at time of publishing and are subject to change. Please contact us if you would like any clarification.

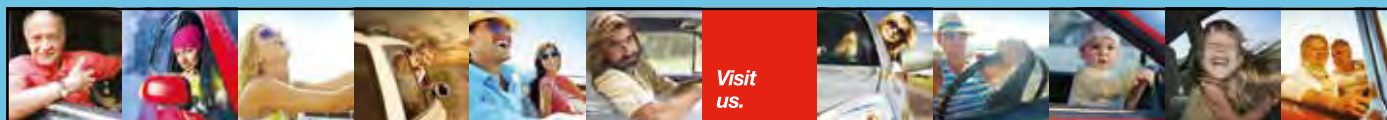
Spot prices can go up and down as they are affected by demand in energy and weather conditions. We have calculated these prices using the average spot price of 5.7c per kWh at night over the last 7 years, however this is no guarantee of current or future prices.

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Simon Lucas North Shore	Auckland
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Auckland Motors Mitsubishi	Auckland
Roger Gill Mitsubishi	Pukekohe
Saunders Mitsubishi	Thames
Ingham Mitsubishi	Hamilton
Bay City Mitsubishi	Tauranga
Piako Mitsubishi	Rotorua
Wings & Wheels	Taupo
W R Phillips, New Plymouth	New Plymouth
Wayne Kirk Mitsubishi	Napier
Wanganui Mitsubishi	Whanganui
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Christchurch Mitsubishi	Christchurch
Caroline Mitsubishi	Timaru
Stephen Duff Motors	Dunedin
Balclutha Mitsubishi	Balclutha
Southern Mitsubishi	Invercargill

NEW EV CAR TYPES				
MAKE	MODEL	TYPE	PRICING RRP est.	APPROX RANGE KMS
BMW	i3	BEV	\$76,900	200 km
	i3s	BEV	\$84,300	200 km
Hyundai	Ioniq	BEV	\$59,990	220 km
	Ioniq Elite	BEV	\$65,990	220 km
Renault	Zoe 40 kWh	BEV	\$68,990	300 km
	Kangoo van	BEV	\$74,990	160 km
Tesla	Model S 75/100 kWh	BEV	\$121,395	350 - 540 km
	Model X 75/100 kWh	BEV	\$129,145	380 - 475 km
Volkswagen	e-Golf	BEV	\$61,990	220 km
Audi	A3 Sportback e-tron	PHEV	\$69,900	45 km + 600 km
	Q7 e-tron	PHEV	\$158,400	54 km + 800 km
BMW	i3 - Range Extender	PHEV	\$84,500	200 km + 130 km
	i3s - REX	PHEV	\$91,900	200 km + 130 km
	i8	PHEV	\$281,200	37 km + 400 km
	225xe	PHEV	\$69,800	41 km + 550 km
	330e	PHEV	\$91,600	40 km + 550 km
	530e	PHEV	\$136,400	50 km + 600 km
	740e	PHEV	\$202,700	48 km + 550 km
	X5 xDrive40e	PHEV	\$152,700	30 km + 800 km
Hyundai	Ioniq Plug-in	PHEV	\$53,990	63 km + 1040 km
	Ioniq Plug-in Elite	PHEV	\$59,990	63 km + 1040 km
Kia	Niro	PHEV	\$55,990	55 km + 850 km
Mini	Countryman	PHEV	\$59,900	30km + 500 km
Mitsubishi	Outlander	PHEV	\$60,990	50 km + 500 km
	Mercedes Benz	PHEV	\$96,400	31 km + 700 km
	C350 e Sedan	PHEV	\$99,400	31 km + 700 km
	C350 e Estate	PHEV	\$143,500	30 km + 600 km
	GLE500 e	PHEV	\$149,900	30 km + 700 km
	S500 e	PHEV	\$255,000	30 km + 700 km
Porsche	Cayenne S e-hybrid	PHEV	\$177,800	20 km + 750 km
	Panamera Turbo S e-hybrid	PHEV	\$428,400	30 km + 750 km
Toyota	Prius Prime	PHEV	\$48,490	50 km + 1000 km
Volvo	XC90 T8	PHEV	\$134,900	44 km + 600 km
	XC60 T8	PHEV	\$94,900	40 km + 600 km

BEV - Battery Electric Vehicle
PHEV - Plug-in Hybrid Electric Vehicle



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USED EV CAR TYPES

MAKE	MODEL	TYPE	PRICING RRP EST.	APPROX RANGE KMS
BMW	i3	BEV	\$38k - \$70k	200 km
Hyundai	Ioniq	BEV	\$52k - \$57k	220 km
	Ioniq Elite	BEV	\$55k - \$60k	220 km
Kia	Soul EV	BEV	\$38k	150 km
Mercedes Benz	B250 e	BEV	\$48k - \$51k	140 km
Mitsubishi	i-Miev	BEV	\$11k - \$17k	100 km
	B-Miev Van	BEV	\$12k	100 km
Nissan	LEAF Generation 1	BEV	\$9.5k - \$18k	120 km
	LEAF Gen 2 - 24 kWh battery	BEV	\$14k - \$28k	135 km
	LEAF Gen 2 - 30 kWh battery	BEV	\$24k - \$43k	180 km
	LEAF ZE1 - 40 kWh battery	BEV	\$53k - \$64k	250 km
	e-NV200 van	BEV	\$20k - \$26k	140 km
Renault	Zoe 22 kWh	BEV	\$30k	220 km
	Zoe 40 kWh	BEV	\$43k - \$48k	300 km
Smart	Fortwo	BEV	\$20k	100 km
Tesla	S 75	BEV	\$118k	350 km
	S P85	BEV	\$97.5k	350 km
	S 90D	BEV	\$149k	420 km
	X 75D	BEV	\$120k	340 km
	X 90D	BEV	\$170k	410 km
Volkswagon	e-Golf - 24kWh battery	BEV	\$40k	130 km
	e-Golf - 36kWh battery	BEV	\$61k - \$63k	200 km
Audi	A3 Sportback E-Tron	PHEV	\$55k	45 km + 600 km
	Q7 e-tron	PHEV	\$135k	54 km + 800 km
BMW	i3 REX	PHEV	\$40k - \$65k	200 km + 150 km
	225xe	PHEV	\$55k	41 km + 550 km
	330e	PHEV	\$50k - \$77k	37 km + 550 km
	X5 xDrive40e	PHEV	\$140k	30 km + 800 km
	i8	PHEV	\$125k - \$235k	37 km + 400 km
Mercedes Benz	C350 e Sedan	PHEV	\$64k - \$90k	31 km + 700 km
	GLE500	PHEV	\$150k	30 km + 700 km
	E350 e	PHEV	\$120k	30 km + 600 km
	S500 e	PHEV	\$101k	30 km + 700 km
Mini	Countryman Cooper SE	PHEV	\$67k	30km + 500 km
Mitsubishi	Outlander	PHEV	\$29k - \$68k	50 km + 500 km
Porsche	Cayenne S e-hybrid	PHEV	\$135k	20 km + 750 km
Toyota	Plug-in Prius	PHEV	\$19.5k - \$36k	26 km + 800 km
Volvo	XC90 T8	PHEV	\$130k	44 km + 600 km

BEV - Battery Electric Vehicle
PHEV - Plug-in Hybrid Electric Vehicle

USED DEALERS LIST

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Wholesale Autos 0800 405 065 info@wholesaleautos.co.nz	Auckland
Harwood Cars 027 492 2218 www.harwoodcars.com	Auckland
Volt Vehicles 0800 748 658 022 4800 722 david@voltvehicles.co.nz	Auckland
PlugN Drive NZ	Auckland
Farmer Auto Village 07 578 6017 info@farmerautovillage.co.nz	Tauranga
EV Central 021 184 2157 inquiries@evcentral.co.nz	Taupo
Drive EV 027 521 0429 07 378 0082 steve@driveev.co.nz	Taupo
The Car Man	New Plymouth
Coventry Cars Hybrid & Electric 04 384 4536 salesteam@coventrycars.co.nz	Wellington
Gazley	Wellington
Cooper Auto Company	Wellington
The Car Company Nelson	Nelson
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Metro Christchurch 03 348 5855 chrisn@metrochch.co.nz	Christchurch
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MICRO EVS



Electric bike just the ticket

You've just gotta get an electric bike.

Test one for free or hire one to try it out – few can resist.

I grabbed a Big Street Bikers' (BSB) urban commuter e-bike from BSB's Rechargery to try over Easter. It has teamed up with Mercury to provide a solar-powered electric bike recharging station in Auckland.

Just the short kilometre hop back to the office was a treat. I can understand why e-bike riders have mile-wide smiles, especially when the sun's out and the scenery breathtaking.

I was back in no time though, thanks to the cycle paths and short waterfront stretches around the Viaduct Harbour.

The journey home was a different story – a puncture at Newton caused by glass at the intersection cut the ride short.

I always carry a spare tube and gas cylinder for my "bullet-proof" road bike's high-pressure tyres but these were no good for the fatter e-bike ones.

Call home, get a lift in peak traffic, try to fix with puncture repair kit but the patch doesn't stick properly – or else I've missed more glass cuts.

Rory Hunter from the Rechargery kindly gives me a new tube and I'm on my way again.

I'm told the Rechargery is investigating getting puncture proof tyres – a good idea from what I've seen.

There's a considerable amount of glass on the cycle paths and at intersections lately. I wonder who cleans it up? When I'm stopped, I usually try to shift the worst of it.

Back on the road and cycleways again, the BSB bike zooms along. In fact, I'm hardly out of three on the 0-5 speed pedal assist and still doing around 30kmh-plus.

It almost needs another gear because the bike can hit close to 40kmh and my feet seem a blur.

I don't have to work up a sweat either, although an e-bike will still let me



EVtalk editor Geoff Dobson with the BSB urban e-bike.

get plenty of exercise using lower pedal assist.

The 36V 300W brushless motor packs plenty of punch.

The only time I use the thumb throttle is for a bit of extra oomph up a steep section while carrying a heavy backpack (the laptop, bike charger, lunch, clothes and other gear) on the 23km stretch from home to work.

I like the Mercury yellow livery on the e-bike too – stands out. Customers can, however, get a custom paint job and logos added for little extra cost.

Discounts are also offered to Mercury customers for selected e-bikes.

BSB says its bikes have been tested and tweaked to suit New Zealand conditions. Sure seems that way to me.

It's comfortable to ride, handling bumps and potholes with ease – especially with front fork suspension (which you can turn off if you wish).

A step-through, it's easy to dismount or rest while waiting for lights to change, and these are a popular style.

The 10AH removable battery holds a charge well, easily capable of do-

ing 40km to 50km. After 23km the battery is barely down to half strength, and that's even after a few steep sections.

Disc brakes ensure plenty of stopping power, required when a pedestrian steps out on the road in front of me near the Viaduct. I don't even have time to sound the bell or yell a warning. Not sure who got the biggest fright.

The Shimano seven-speed gears are easy to use – I generally stay in top gear unless starting.

The BSB e-bike also has an intelligent LCD controller, giving you all the information you need at a glance, including battery power, speed, distance, pedal assist level and more.

A bright LED headlight and battery powered rear light ensure the rider is visible, although I also have flashing rear lights on my Livall smart helmet and put an extra flashing light on the handlebars with daylight saving ended.

I prefer wearing bright and high visibility gear too – anything to ensure you are better seen, especially in dimmer winter light.

The cycleways make riding a dream – I now only have to dice with traffic on the home stretch or in a short section between the Nelson St and Quay St cyclepaths.

E-bike riders should also remember to warn people on the shared pathways that they are about to pass from behind. Sound a bell or call out if necessary. Many people have difficulty judging an e-bike's speed, so care is needed – especially in traffic.

I can see why e-bikes are popular though – I've noticed many more on the cycleways this year.

They're quick, take steep sections in their stride and you can ride them in your work clothes (I've seen people in suits on them).

A BSB urban e-bike is priced at \$2500, with Mercury customers getting it for \$2250.

Give one a try – the Big Street Bikers' team at the Rechargery can help. □



MICRO EVS



Solar-powered Rechargery runs hot

New Zealand's first public solar-powered electric bike charging station is running hot.

The Rechargery has been busy since opening on February 15 with lots of electric bikers popping in, **Matt Weavers** says.

He's the co-founder of Big Street Bikers (BSB) which runs the converted container facility next to Auckland's Viaduct Harbour, at the bottom of the Nelson St bike path.

"The moment people get on electric bike for the first time is a wonderful thing to see and that's happening every day," Weavers says.

"We want it to become a home for the electric bike culture of Auckland and that's slowly happening - which is really cool."

Many car users are also asking questions about how it all works, then taking an e-bike test ride, Weavers says.

BSB has joined with power company Mercury to use an array of solar panels supported by batteries to provide most of the power e-bikes need to get around.

Aucklanders and visitors can test ride an e-bike around the harbour area or even hire one for a full day.

BSB also has ride-to-own subscription plans, designed to make e-bikes more affordable and accessible for commuters and students - with discounts available for Mercury customers.

Rechargery visitors can bring their own e-bike to charge for free.

"The solar-powered shop concept has proven to be a hit with everyone. Most people are enamoured of the thought that we are providing a transport solution that doesn't rely on digging up old dinosaurs and wrecking the planet," Weavers says.

"It's the first of its kind in New Zealand and lots of Kiwis that pop by are quite proud that it's actually living

up to our image of a 100% pure New Zealand.

"We're chuffed to have the support of Mercury to get the concept off the ground. They have done a great job in raising the profile of electric bikes so it was a natural alignment for us."

Weavers says it's a sustainable step



The Rechargery, Auckland's solar-powered electric bike facility.

in the right direction to help solve the city's traffic issues.

As a pilot scheme, the Rechargery will run at least to the end of April then it might become a permanent fixture and the first stage of a point-to-point e-bike share system which runs on sunshine.

"We're huge fans of electric transport in general and the Rechargery is a wonderful opportunity for us to help inspire more Kiwis to experience the joy of riding e-bikes," Mercury chief marketing officer **Julia Jack** says.

"The fact that we're helping to power the Rechargery with Mercury solar is a great bonus and the perfect example of energy made wonderful."

Rory Hunter is among several staff at the Rechargery helping customers.

He says there's miles of smiles from people who return from test riding an e-bike.

Many go on to hire or buy one, he says. Age doesn't seem to matter either.

"We have people in suits and from the young to the elderly try out the

e-bikes."

He says the chance of a free test ride is a big drawcard but many visitors also pop in out of curiosity.

A variety of e-bikes - from the popular step-throughs to mountain e-bikes and folding models - are offered at the Rechargery.

Those wanting to buy an e-bike can order one there and the bike is brought in from BSB headquarters.

The fact that Mercury customers can get a \$250 discount on their e-bike is also popular with buyers, Hunter says.

The Rechargery at 18 Viaduct Harbour Ave is open 7am-6pm Monday to Friday and 10am-3pm on Saturday and Sunday.

Visit www.bigstreetbikers.co.nz for more information. ■

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Leaf battery trouble dents trade

Continued from page 1

"I think the recent decision of Nissan Japan to undertake an exchange programme reflects that."

He's referring to a move to have Nissan Leaf owners in Japan exchange their old batteries for refabricated ones under a new, fee-based system. It will cover 24kWh, 30kWh and 40kWh batteries.

Nissan is using the battery refabrication capabilities of 4R Energy Corp, a company established through a joint venture with Sumitomo Corp, with a new factory in Namie, eastern Japan, serving as a global centre for 4R.

Old batteries are planned for energy storage systems and possibly for use in vehicles such as electric forklifts.

"As demand for electric vehicles grows, the number of used batteries will increase significantly," Nissan says.

"Nissan hopes that by reclaiming these batteries, it can help lower battery replacement costs and heighten the used-car value of electric vehicles.

"This will enhance the electric-car ownership experience, which in turn will help promote their use, ultimately contributing to lower CO₂ emissions."

Mersi says he will welcome the results of Nissan's review of the 30kWh battery issue when it is completed.

Nissan New Zealand managing director **John Manley** has been reported as saying a thorough internal investigation is being held into the allegations of excessive degradation of the Leaf 30kWh batteries.

No timeframe for the investigation

has yet been publicised.

VIA chief executive and EV leadership group member **David Vinsen** led an industry delegation to Taiwan this month to check with battery makers about getting replacement batteries for EVs like the Leaf.

The visit coincided with the Taipei International Auto Parts and Accessories Show Trade Fair on April 11-14.

Meanwhile, potential Kiwi buyers of 30kWh Leafs are being cautious and dealers say the issue is affecting sales.

The 30kWh battery issue appears to have impacted on prices at auctions in Japan too.

One report suggests Nissan Leaf 30kWh prices in Japan are now around a million yen (NZ\$12,845) when they are normally about Y1.3m to Y1.5m (NZ\$16,700 to NZ\$19,267) as Kiwi interest in obtaining them falters.

So how did the situation come about?

Flip the Fleet, a national "citizen science" coalition of more than 640 electric and plug-in vehicles owners who share data on the performance of their vehicles in New Zealand, says it had fielded an increasing number of queries from concerned 30kWh Leaf owners in the months leading up to the release of its report.

The owners had noted a fall in their battery state of health (SoH) or bars. Flip the Fleet enlisted help to get more battery scans. Its statistician, **Dr Daniel Myall**, and others in the organisation analysed the data.

The report released on March 16

alleged some two-year-old 30kWh Leaf battery packs were reportedly degrading at about three times the rate of the 24kWh variant and the problem appeared to be accelerating.

Flip the Fleet says it alerted Nissan and provided a draft report, estimating about 600 30kWh Leafs are on the road here with at least another 180 due.

"We do not know for certain what the underlying causes of the observed rapid decline are," Flip the Fleet says.

It suggests a combination of elevated temperatures while the battery is highly charged could be a factor.

Rapid charging alone cannot explain the observations, Flip the Fleet says.

Insufficient testing has been done to determine whether the range is affected, it says.

"We advise all buyers of any EV model to always get a battery scan check before purchase, where possible."

Consumer New Zealand says it believes owners with cars exhibiting the problem have a case for recourse under the Consumer Guarantees Act.

Meanwhile, in some good news for Nissan, its new Leaf has been named the "2018 World Green Car" at the 2018 New York International Auto Show (March 30-April 8).

Nissan says it remains on track to deliver the new Leaf to the New Zealand market next year.

More than 300,000 Leaf electric cars have been sold worldwide.

Visit www.flipthefleet.org for more information. ■

New Zealand's cheapest new plug-in

Continued from page 1

Specification levels are solid, with dual-zone air-conditioning, satellite navigation, premium JBL stereo, adaptive cruise control, autonomous emergency braking, lane keeping system and road sign assist. There is one main option, a leather interior.

It also features a gas-injection heat pump, which can heat the vehicle with warmth captured from the outside air.

Although the drivetrain is similar to



the standard Prius, it features a new one-way gear within the transaxle which allows the hybrid system gen-

erator to act as a second electric drive motor, increasing available electric-only power and reducing engine start-up.

"This is the \$150 a year car," Toyota NZ general manager of product and new vehicles sales **Neeraj Lala** says.

"That's the yearly running costs you'll pay in New Zealand for the Prius Prime according to Energywise.

"We are quite confident with where this car is priced and its position in the market." ■



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INTELLIGENT TRANSPORT

Connected Vehicles

The transport revolution

Transport is undergoing a revolution.

City residents are already using a variety of ways to get around and the present-day vehicle ownership model is expected to all but disappear.

With little need for carparking, dwellings such as Auckland's new "Daisy" apartment block are now foregoing private parking, especially with public transport close by, and are opting instead for a couple of car-sharing spaces and bicycle (including electric bike) spaces.

There's even talk about how to use parking buildings and spaces when they become vacant.

Thought-provoking ideas around transportation and city living were presented by keynote speaker **Greg Lindsay** and others to about 150 delegates at the Intelligent Transport Systems (ITS) NZ "T-Tech" Conference in Auckland on March 19 and 20.

The New Cities Foundation senior fellow, Lindsay outlined a possible future where city residents could use a variety of transport options from ride-share and autonomous shuttles to cycling or other alternatives.

Cities will change as a result, Lindsay says.

He suggests forming steering committees to ensure people get the transport they want rather than just waiting for companies like Uber to provide them.

He also urges people to know what data is needed



and what can be done with it, cross-train staff and build opportunities, rethink community benefits and strategies, explore demand and reshape people's approach to transport, create mobility as a service roadmap, launch a micro-transit pilot, transition from transport operators to mobility managers and embrace connected mobility.



Greg Lindsay

He broadly labelled transport as taxis, ushers, conveyors, buses, rovers and shuttles.

Autonomous vehicles (AVs) can drop people off and park themselves but operators need to work together to ensure "no zombie AVs" where empty shuttles take up street space, he says.

He painted a picture of many possibilities, including AV "shops" coming to designated areas close to residents, and says it's up to people to decide.

Those possibilities extend

Twyford says New Zealand is seen as a world leader in ITS, pointing to the self-piloted electric air taxi trial in Canterbury by Zephyr Airworks as an example.

to how New Zealand can benefit from the \$1.5 billion annual expected value to the national economy from ITS.

The value was highlighted in a new report "Unlocking Commercial Opportunities of Intelligent Transport Systems" released by Business NZ.

Transport minister **Phil Twyford** announced at T-Tech that a new Future Technology Leadership Group could establish a 10-year roadmap to do just that.

Twyford says New Zealand

is seen as a world leader in ITS, pointing to the self-piloted electric air taxi trial in Canterbury by Zephyr Airworks as an example.

Zephyr Airworks chief executive **Fred Reid** talks up New Zealand as a country with a "can do" attitude and the right sort of regulations to allow that.

It was selected for the trial ahead of other countries, mainly on the basis of an 18-point checklist.

Dubbed Cora, the autonomous vertical take-off and landing aircraft is capable of carrying two passengers on short trips and has an experimental airworthiness certificate from the New Zealand Civil Aviation Authority.

The Business NZ report, which also considered drones, smart logistics and AVs, says New Zealand has a good regulatory and business environment to benefit from ITS.

An example of how tech-

Continued on page 19



INTELLIGENT TRANSPORT

Connected Vehicles

Continued from page 18

nology can save lives was the NZ Transport Agency "hack-athon" Save One More Life which saw 120 developers and technical, engineering and transport experts spend 48 hours designing ways to make our roads safer, Twyford says.

It resulted in a new app to improve the driving skills of teenagers and those on restricted licences and is forecast to save 55 lives a year.

The use of ITS for road safety improvements was also outlined at the T-Tech conference by Ministry of Transport safety and mobility principal adviser **Iain McGlinchy**.

But he says some people in the road safety community are "not so convinced" about the benefits of new technology such as ITS and few road safety strategies have ITS as a major component.

McGlinchy says many parts of the world are seeing road death tolls rising recently, despite decades of improvement. Technology could help turn the tide, he believes.

A vehicle standards inventory includes a 47-page list of significant vehicle technologies and production standards. They include electronic stability control (ESC) and anti-lock braking (ABS) – both for heavy vehicles with motorcycles included in the latter – and auto emergency braking (AEB) for all vehicles except motorcycles, McGlinchy says.

Increased safety features also soon need to be met for the European new car assessment programme (Euro NCAP) to gain a top five-star rating. These include driver monitoring, AEB and auto-

nous emergency steering.

Standards likely to be introduced by 2020 might also require vehicle-to-vehicle data exchange and vehicle

to infrastructure communication, McGlinchy says.

Informed discussion is needed around ITS and road safety, he says.

Another factor in ITS on the road is satellite positioning, particularly for the many connected

governments.

Initially, both considered the several hundred million dollars in cost of developing and operating SBAS outweighed any benefits.

But now Australia is providing A\$12 million and New Zealand A\$2m towards the two-year trial due to finish in June 2019, Land Information New Zealand (LINZ) positioning and resilience group manager **Graeme Blick** told the T-Tech conference.

More than 30 projects

whereas SBAS improves the accuracy, integrity and availability of satellite information and brings the accuracy down to a metre or less, he says.

One reason for the trials is the increased technical componentry in new vehicles which would use such information, including mapping and improving safety.

"If someone is in the wrong lane on the motorway or the wrong side of the road, they can be warned."

Many other countries already have similar well-developed systems, such as the Galileo global navigation satellite system in Europe, which vehicles can be tailored for.

Glick says SBAS can be used to better chart harbours and ship locations, improving navigational efficiency. Train companies can also use it to determine what track a train is on and improve services.

Planning and urban design expert **David Dixon** of Stantec North America says the real disruption will come from shared autonomous vehicles (SAVs) which he predicts will flourish in urban environments.

These will literally be an "app click" away, reducing parking needs and traffic generation while making transport more affordable.

Other speakers talked about transport changes helping reduce congestion, environmental pollution and carbon use, providing some answers to climate change and impacting on our health and wellbeing.

There's no doubt ITS has a major role to play. The question is how well we all adapt?

If, as suggested at the conference, it is a customer-driven solution, then changes will be coming sooner rather than later. ■



Iain McGlinchy



Greg Lindsay and David Vinsen at T-Tech

and AV applications.

It's usually known as GPS (global positioning system) or GNSS (global navigation satellite system) but the accuracy of such systems in Australia and New Zealand is not as good as it could be.

Improved positioning services, such as satellite-based augmentation systems (SBAS), are midway through a two-year evaluation by the New Zealand and Australian

have been commissioned to demonstrate the potential of SBAS technology across various sectors including road, rail, aviation, maritime transportation, agriculture and construction.

Blick says the study will determine whether a business case can be established to invest further in a fully operational system.

GPS (GNSS) is accurate to within about 10 metres

Artificial intelligence world changing

Artificial intelligence (AI) is changing the world.

Experts told more than 500 people at the AI-Day event in Auckland on March 28 just how those changes are being made.

AI applies to all, from businesses and projects such as autonomous vehicles to individuals.

It's part of everyday life and about to become more so.

"We're really at the beginning of the next phase," keynote speaker Microsoft AI business corporate vice-president Steve Guggenheimer says.

With growth in data continuing apace, AI can process it.

Guggenheimer, known as "Guggs", says by 2020 data worldwide will reach 44 zettabytes or about six terabytes of data for every person.

In other words, huge amounts.

Storage will adapt and people will be conversing more with robot assistants - like Siri, Cortana and other chatbots - and passed on to a human if they don't get the response they want.

Guggs talks about the instant ability to translate languages; to connect with multiple devices; medical assistance via face recognition or other smart device (medication arriving by drone); helping businesses such as improving customer service and providing virtual meetings; and using "AI for Good" to improve the planet (to combat global warming, for example).

Privacy, legal and other ethical matters around AI need more work and Guggs referred attendees to a 146-page Microsoft book *The Future Computed* about how AI is expected to help people in all facets of life.

"In 2038, a driverless vehicle will take you to your first meeting while you finalise a presentation on the car's digital hub," the book says.

"Cortana will summarise research and data pulled from newly published articles and reports, creating infographics with the new information for you to



Steve Guggenheimer

review and accept."

It goes on to say Cortana will automatically reply to routine emails, re-route others and request a due date.

The conference heard that AI will take care of more mundane data and information, allowing humans to optimise their time.

"The next generation is growing up with new tool sets," Guggs says.

Ohmio Automation research and development coordinator **Mahmood Hikmet** outlined the Auckland company's progress with autonomous vehicles.

He expects it will launch the Ohmio Lift in May. The AV shuttle will be capable of carrying up to 20 people and is likely to be first put into service at Christchurch airport.

Hikmet explained the different levels of autonomy, from zero to five with the latter being fully autonomous.

He says many companies are aiming for level five but, as seen in the news recently, it doesn't always end well.

Ohmio driverless vehicles operate on a different system to many overseas AVs with Hikmet showing how its AVs use AI, sensors, GPS, Lidar and other means to navigate.

Ohmio vehicles are also able to travel in convoy and will be able to follow "vir-



Mahmood Hikmet

tual tracks" on demand, he says.

He also explained how the company had overcome issues with large trees disrupting GPS systems and how its engineering and AI team interpreted the problems and came up with solutions.

The engineering team suggested cutting down the offending tree "but we cannot do that in every case", Hikmet joked.

Other speakers covered how they were dealing with AI. They included communications and digital media minister **Clare Curran**, AUT design and creative technologies faculty dean **Guy Littlefair**, Westpac chief information officer **Dawie Olivier**, Orbica founder **Kurt Janssen**, the Cacophony Project founding coordinator **Grant Ryan**, Netsafe chief technology officer **Sean Lyons**, Amazon tech for social impact engagement manager **Alayna Van Dervort**, Centrality AI founder **Aaron McDonald**, IBM Design AI designer **Adam Cutler** and Soul Machines representatives **Greg Cross** and **Dr Mark Sagar**.

A workshop programme was held the next day at AUT.

Videos of each AI-Day talk and panel discussion will be published on YouTube.

Another AI-Day will be presented next year. ■



Satellite positioning improvements evaluated

Satellite positioning is a major component of many connected and automated vehicle applications and is especially needed for autonomous vehicles (AVs).

It's usually known as GPS (global positioning system) or GNSS (global navigation satellite system), but the accuracy of such systems in Australia and New Zealand is not as good as it could be.

Improved positioning services, such as satellite-based augmentation systems (SBAS), are midway through a two-year evaluation by the New Zealand and Australian governments.

Initially, both governments considered the cost of several hundred million dollars in developing and operating SBAS outweighed any benefits.

But now Australia is providing A\$12 million and New Zealand A\$2m towards the two-year trial due to finish in June 2019, Land Information New Zealand positioning and resilience group manager **Graeme Blick** told ITS NZ's "T-Tech" conference in Auckland on March 19 and 20.

More than 30 projects have been commissioned to demonstrate the potential of SBAS technology across various sectors, including road, rail, aviation and maritime transportation, agriculture and construction.

Blick says the study will determine whether a business case can be established to invest further in a fully operational system.

GPS (GNSS) is accurate to within about 10 metres whereas SBAS improves the accuracy, integrity and availability of satellite information, bringing accuracy down to a metre or less, he says.

One reason for the trials is the increased technical componentry in new vehicles that would utilise such information, including mapping and improving safety.

"If someone is in the wrong lane on the motorway or the wrong side of the



Galileo in orbit. Photo: ESA



New Zealand and Australia could learn more from the Galileo global navigation satellite system in Europe.

road, they can be warned."

Blick says many other countries already have similar well-developed systems, such as the Galileo global navigation satellite system in Europe, which vehicles could be tailored for.

SBAS can also be used to better chart harbours and ship locations, improving navigational efficiency, he says.

It's being used, for instance, to do sea-floor charting in the Port of New South Wales.

Train companies can also use it to determine what track a train is on and improve services, even providing more trains closer together.

And it's relevant to the airline indus-

try too.

"With SBAS, airlines can fly more often in bad weather and become more confident of safety limits."

He says more accurate information is provided for car mapping and automated driving.

"The AV industry will have multiple technologies working together to position vehicles correctly on the road and to connect with other vehicles – not just SBAS."

Blick says the ministry is looking at such a system for road pricing with accurate SBAS positioning helping to provide a more efficient way of levying road user charges. ■

EVs don't need to be toxic

BY IDTECHEX CHAIRMAN
DR PETER HARROP

Diesel vehicles - land, water and air - are on the way out because they emit poisons.

They include antimony, arsenic, cadmium, cobalt, cyanide, dioxin, lead, nickel, manganese, phosphorus, selenium and sulphur compounds and carcinogenic submicron particulates, organics and more.

The brew has a lot in common with the poisons inhaled from smoking tobacco.

However, the new electronics and electrics in and on vehicles appearing over the next 10 years will contain most of those poisons - and more.

Yes, most might be no threat for one reason or another. But much of them are questionable, particularly since alternatives exist or are emerging.

Indeed, a large number of devices per vehicle, each with minimal toxicant materials, could still add up to something damaging at some stage as EV sales grow rapidly - land, water and air.

The alternatives are mostly little-known and they are rarely a priority in funding for optimisation or adoption.

The new IDTechEx report *Toxicant Materials and Alternatives in Electronics/Electrics 2018-2028* reveals many safer alternatives and the research to produce them.

It also identifies where affordable alternatives with adequate electrical performance do not exist. There are gaps in the market, opportunities for someone and deserving of redirected research funding.

Although many of the forms of poison in new electronics and electrics are relatively safe because of their small volumes, encapsulation and other factors, the report concludes the rapid proliferation of poisons in a widening variety of applications requires better monitoring and control.

Specifically, one carcinogen associated with birth defects should have a date set for a global ban since alternatives are already successful in the marketplace in these devices in vehicles. A date is proposed.

So what else needs watching?

Though not always, antimony is used in some thermos-electrics and batteries, as a flame retardant and as dopant in microchips.

Arsenic is in planned gallium arsenide solar bodywork and is also a microchip dopant. See the IDTechEx report *Energy Independent Electric Vehicles Land, Water, Air 2018-2028*.

However, that toxic gallium arsenide will be at a level of only ten grams or less per car. One manufacturer says it is acceptable in landfill.

Nonetheless, care will be needed if millions of cars adopt it. Controlled disposal might be prudent by then - a date is proposed. A business opportunity exists for an equally efficient, equally flexible alternative; researchers are on the job.

Cadmium is in some quantum dot displays and researchers' photovoltaics, and there's cobalt in lithium-ion batteries, thermos-electrics and motor magnets.

Beryllium is in some vehicle parts. Dioxins are emitted by inappropriate burning of PVC; manganese

is in lithium-ion batteries, electroluminescent displays and thermos-electrics.

Lead is in a whole panoply of existing and planned electronics and electrics such as the new perovskite photo-



Dr Peter Harrop

voltaics, some quantum dot displays such as QLED television, sensors, piezoelectric transducers, actuators and energy harvesters.

The authors believe it is time for developed countries to set a date for banning lead acid batteries. They suggest what that date should be.

Many vehicles have abandoned lead acid batteries - from the Porsche Spyder hybrid to many pure electric vehicles and planned 48V mild hybrids. See the IDTechEx report *Mild Hybrid 48V Vehicles 2017-2027*.

Of the other poisons declining from the diesel collapse, nickel returns in motor magnets and lithium-ion batteries but is not a major threat.

Selenium appears in photovoltaics and sensors.

Sulphur compounds are found in sensors, electroluminescent displays, photodetectors, planned photovoltaics and QLEDs.

And those diesel nanoparticles associated with breast and lung cancer, asthma, heart disease, depression, uncontrolled coughing and so on? Well, something similar is used to make superca-

pacitor electrodes and many new forms of electronics, though mercifully not as inhalable powder under normal operating conditions. There could be a disposal problem.

This is only a sample of diesel poisons returning or back already. Most are a low threat at present - indeed QLEDs and thermos-electrics have yet to appear in a car near you, and quantum dots and microchip doping represent tiny volumes.

However, there is a prospect of some of the new poison-based devices selling in huge numbers. Think sensing, actuating and energy harvesting leading to up to 40 lead-based piezo-electrics per vehicle on one billion vehicles.

Many such as those piezo-electrics can be a threat if abused or on disposal but represent no problem in normal use. Other examples, including ones of concern when in use, are being announced all the time.

With some admirable exceptions, research laboratories and their funding typically chase performance before safety. That impedes the development of non-toxicant products.

Identifying and testing these new devices and electrical materials would be very demanding. Policing laws restricting their use or their toxicant content could become near impossible in some cases.

Toxicity reference works are mostly badly out of date, repeating nostalgia like the contents of a cathode ray tube.

It is unfortunate that lead acid batteries are being replaced by lithium-ion

Continued on page 24

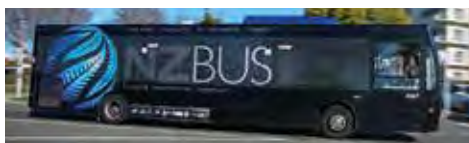
Electric buses part of \$14.8m contract

Electric buses are part of a new \$14.8 million contract awarded to Infratil-owned NZ Bus for services in the western Bay of Plenty.

The Bay of Plenty Regional Council announced the deal to replace current contracts worth around \$12.8m held by Go Bus, Reesby Rotorua, Bethlehem Coachlines and Uzabus which expire in December this year.

The new Bayhopper network will feature redesigned routes, new interchanges, extended operating hours and more frequent services with a fleet of low-emission vehicles, including five state-of-the-art electric buses.

All buses will have bike racks and customers will have access to real time journey information and bus tracking, the council says.



NZ Bus will run five electric buses under a new deal.

Its public transport committee chairman **Lyall Thurston** says the tender process was highly competitive for the nine-year contract that will enhance public transport in Tauranga.

"All of the proposals were strong and the council acknowledges the time and

effort put into them.

"Ultimately, NZ Bus presented the best combination of price and quality for Tauranga ratepayers. The procurement team were particularly taken with the increased driver pay offered by NZ Bus," Thurston says.

The country's largest public transport provider, NZ Bus also hold contracts with Auckland Transport and Greater Wellington Regional Council.

Last year it lost many of its contracts in the Wellington region to Masterton-based Tranzit Group.

From 2019, NZ Bus will own and operate a fleet of more than 700 buses from 12 depots and employ about 1400 people. ■

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EV charging partnership formed

A partnership to simplify and improve customers' access to technology solutions for electric vehicle charging infrastructure in New Zealand has been clinched.

ABB has signed a third-party channel agreement with Singer Group for it to provide turnkey solutions for ABB's EV charging infrastructure and service its uninterruptible power supply (UPS) products and solar inverters.

Established in 1953, New Zealand-owned and managed Singer has built a strong reputation as a provider of services to the electrical industry.

From being an Auckland electrical contractor specialising in high-rise office tower and apartment projects, Singer has evolved to cover construction, maintenance and automation services for various industries.

It will deliver services for ABB's EV charging portfolio in New Zealand which include site inspection, procurement, supply, installation, commissioning and ongoing maintenance.

As a channel partner, Singer will also be a certified service provider for ABB's single and three-phase UPS products, and solar inverters.

The partnership demonstrates the power of collaboration and how it can support the market and customers, ABB New Zealand managing director **Ewan Morris** says.

"ABB's partnership with Singer demonstrates a winning combination of extensive product portfolio and techni-



Jeff McLaren, left, and ABB EP local sales and marketing manager Chris Thomas.

cal expertise, and detailed knowledge of industries and applications, project experience, and local market presence."

Through the partnership, ABB aims to simplify customers' access to an extensive range of electrification products, including low and medium-voltage products, solar inverters, UPS and power conditioning products and EV charging infrastructure.

"Together we are stronger by being able to offer turnkey electrical solutions unmatched in the New Zealand market," Singer Group managing director **Jeff McLaren** says.

Through its extensive ABB Ability enabled EV charging infrastructure, ABB is laying the foundations for a future of smarter, reliable, and emission-free mobility.

ABB Ability is the company's unified, cross-industry digital capability — ex-

tending from device to edge to cloud — with devices, systems, solutions, services and platforms.

ABB is helping drive the transportation revolution by designing, building and maintaining the infrastructure and laying the groundwork for EVs.

It offers a total solution from compact, high quality AC wallboxes to reliable DC fast-charging stations with robust connectivity and innovative on-demand electric bus charging systems.

The company is a pioneering technology leader in electrification products, robotics and motion, industrial automation and power grids.

It serves customers in utilities, industry and transport and infrastructure globally.

It's also involved with Formula E, the electric international FIA motorsport class.

ABB's new AC wallbox portfolio, comprising 52 different types, provides a high quality, cost-effective electric car charging point for private and business use.

It's particularly suited to businesses wanting to provide overnight charging facilities for customers.

The wallboxes offer a range of connector types, including type 2 socket, type 2 socket with shutter, and type 1 and type 2 cable.

Visit www.abb.com for more information. ■

EVs don't need to be toxic

Continued from page 22

batteries with toxicant electrolytes and poisons of concern such as phosphorus, cobalt, manganese, nickel and carbon allotropes.

Indeed, putative replacements for lithium-ion often involve sulphur and other poisons, although solid-state electrolytes are likely to be non-toxicant

and non-flammable.

Battery elimination is gaining attention, as discussed in the report, but without seriously impacting lithium-ion batteries for at least a decade. That elimination varies from vehicles that only move in daylight to buses and cars powered by supercapacitors, some of which are non-toxicant.

The new IDTechEx report

Toxicant Materials and Alternatives in Electronics/ Electrics 2018-2028 even has a timeline for the planned introduction of "poisons of concern" into everyday life over the next 10 years.

However, it also has a note of optimism - it observes the huge effort to develop lead-free perovskite photovoltaics and some

other alternatives for those worrisome poisons.

Priorities are recommended and a large number of alternative non-toxicant devices, in research or on sale, are identified.

Many alternatives to poisons in electronics and electrical engineering were to be presented at this month's IDTechEx Show! in Berlin. ■

EV numbers still climbing



Like yeast, electric vehicle numbers in New Zealand continue to rise.

Total EVs hit 7233 in March – 333 more than the previous month.

At that rate EV numbers should reach

the 8000 end-of-year target in May, more than six months early.

That would double last year's figures, with the goal for each year to double the previous target (16,000 next year) until the Government's aim of 64,000 EVs on our roads by the end of 2021 is met.

Growth was across all EV sectors, the

latest Ministry of Transport figures show.

New light pure electrics reached 1423 (up 67 on February), used pure light electrics rose 165 to 3829, new light plug-in hybrids recorded 1351 (up 57), used light plug-in hybrids went to 549 (up 42) and heavy EVs increased by two to reach 81.

In March last year, EV figures were just 3187.

Registrations for the first three months of this year stand at 1041 – not far off the 1516 reached for all of 2016 and double that of the 505 in 2015.

March's light EV registrations totalled 337, comprising 209 used EVs and 126 new.

The March registration figure is above the previous month (February recorded 288) but below January's (416). It is the sixth highest monthly figure since August last year. ■

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NEW MAKES AND MODELS MAR 2018

MAKE AND MODEL	TOTAL
----------------	-------

ELECTRIC

TESLA MODEL X	23
TESLA MODEL S	19
HYUNDAI IONIQ	8
VOLKSWAGEN GOLF	6
BMW I	5
RENAULT KANGOO	1
RENAULT ZOE	1

PLUG-IN HYBRID

MITSUBISHI OUTLANDER	30
KIA NIRO	9
VOLVO XC60	5
MINI COUNTRYMAN	4
BMW I3	3
HYUNDAI IONIQ	2
MERCEDES-BENZ C-CLASS	2
VOLVO XC90	2
BMW 3 SERIES	1
BMW I	1
PORSCHE PANAMERA	1

USED IMPORTS MAR 2018

MAKE	MODEL	TOTAL
------	-------	-------

BEV - BATTERY ELECTRIC VEHICLE

NISSAN	LEAF	133
NISSAN	E-NV200	8
BMW	I3	4
MITSUBISHI	I-MIEV	3
KIA	SOUL	2
SMART	FORTWO	1
RENAULT	ZOE	1
MITSUBISHI	MIEV	1
MERCEDES-BENZ	B250	1

PLUG IN HYBRID

BMW	I3	12
TOYOTA	PRIUS	22
MITSUBISHI	OUTLANDER	6
MERCEDES-BENZ	C350	1

First truck conversion workshop opens

Continued from page 8

"Our conversion partner EMOSS in the Netherlands has provided the kitsets and knowledge for our team to start completing conversions here in Auckland.

"We are also looking forward to helping other New Zealand businesses convert their fleets for a more sustainable future."

The Government's Low Emission Vehicles Contestable Fund, administered by Energy Efficiency and Conservation Authority, contributed \$500,000 in 2017 to help build the workshop and convert the first two trucks as part of its commitment to

EV development.

Waste Management announced its move towards a fleet of electric vehicles in September 2016 as part of its sustainability commitment.

Since then the company has launched the Southern Hemisphere's first sideloader electric truck for residential wheelie bin waste collections, which has started work on Christchurch streets.

Another sideloader electric truck will soon be operating in Auckland in addition to the electric box body truck which started work in the city in November 2016.

Waste Management has also

added more than 20 electric cars to its light fleet during this time.

"Our move towards electric vehicles reflects our place in a circular economy, where our vehicles can be powered by waste," Nickels says.

"Through our modern, sustainable landfill and energy parks we generate renewable electricity from the gas we capture from the decomposition of waste that we collect."

Up to 95% of gas emissions are captured through this process, putting enough power back into the national grid to power more than 18,000 homes nationally. ■



EV TALK DIARY

EVtalk New Zealand editor
Geoff Dobson looks at the month
gone by on www.evtalk.co.nz



March 1

Gas-guzzler changed to electric

Mercury has used Kiwi ingenuity to convert a gas-guzzling 1957 Ford Fairlane to plug-in electric.

It's considered a poster-child for EVs.

March 5

Treatment won't damage EVs

Heat treatment and other methods of killing pest stink bugs hitch-hiking in vehicles from Japan are unlikely to damage electric vehicles on affected ships, experts say.

The Ministry for Primary Industries says heat treatment could damage EVs but those in the EV industry say it's very unlikely.

EVs are designed to withstand temperature extremes in many countries, GVI general manager **Hayden Johnston** says.

March 6

EVs close to 8000 goal

New Zealand's EV fleet size is closing in quickly on this year's 8000 target, reaching 6884 in February.

All light EV registrations for the month were 281, compared with 230 for February last year, latest Ministry of Transport figures show.

The total in February 2016 was just 62.

March 7

Charging up in minutes

The possibility of being able to charge an electric vehicle in minutes rather than hours could be close.

Researchers have dis-

covered a new material that could boost the performance of a carbon-based supercapacitor (or ultracapacitor), an energy storage device that can be charged very quickly and offload its power fast.

All-electric bus a first

The first fully battery-powered electric bus took to Auckland roads on March 7, servicing AUT's Northcote and Manukau campuses.

The 35-seater is part of AUT's fleet in a joint initiative between AUT, the Energy Efficiency and Conservation Authority and bus company Transitz Group.

March 9

New tyre for EVs

Goodyear has a new tyre for electric vehicles to reduce wear from their powerful instant torque.

One of the world's largest tyre companies, Goodyear unveiled its "EfficientGrip Performance with Electric Drive Technology" tyre at the 2018 Geneva International Motor Show.

Trucks and buses go electric

Heavy vehicles are a huge part of the electric revolution, not-for-profit group Drive Electric says.

On the international stage, major companies such as Tesla and Daimler AG are racing to develop electrified heavy-duty trucks and other vehicles like buses are also part of the mix.

March 12

Proton battery rechargeable

The world's first rechargeable proton battery has been created by researchers at RMIT University in Melbourne, using

carbon and water instead of lithium.

It could rewire how we power our vehicles, homes and devices, they say.

The small prototype can potentially store more energy than lithium-ion batteries.

March 13

No carparks for apartments

What! No car parks in a new Auckland apartment block?

That's right – a 33-unit, \$17.5 million apartment block in Ockham Residential's "Daisy" complex at 11 Akepiro St in Mt Eden doesn't have any private carparks.

But there is room to park 40 bicycles, 12 scooters and two shared cars run through the Cityhop model for residents' use.

March 14

Pilotless air taxi trial

Hailed as the world's first self-piloted electric air taxi, the "Cora" is undergoing tests in Canterbury.

Zephyr Airworks, the New Zealand operating arm of California-based company Kitty Hawk, has unveiled the autonomous aircraft which has vertical take-off and landing ability and can travel 100km.

Cora can carry two passengers.

March 15

VW scaling up EV production

A new electric vehicle "virtually every month" is coming from the Volkswagen Group after next year.

It's expanding EV production worldwide on a "massive scale," Volkswagen AG chief executive officer Matthias Muller says.

Capital's bus fleet ready

Tranzurban's new fleet of electric and environmentally friendly diesel buses is on the way.

Part of the Transitz Group, Tranzurban will operate most of the new Metlink urban bus network from July in collaboration with Greater Wellington Regional Council, rolling out a fleet of new electric and Euro 6 diesel buses to transport commuters.

Kiwi Bus Builders in Tauranga will deliver 40 new buses, including 10 fully electric double-deckers.

March 19

Transport revolution happening

Thought-provoking ideas around transportation and city living were presented by keynote speaker Greg Lindsay to about 150 delegates at the T-Tech Conference in Auckland.

The New Cities Foundation senior fellow outlined a possible future where city residents could use a variety of transport modes, from ride-share and autonomous shuttles to cycling or other alternatives.

March 20

Self-driving vehicle tests halted

Uber Technologies has stopped autonomous vehicle tests after one of its cars collided with a woman pedestrian who died of her injuries in Tempe, Arizona.

It's reportedly the first known pedestrian death involving an autonomous vehicle.

Roadmap to harness \$1.5 billion

A new Future Technology Leadership Group will help New Zealand harness some of the estimated \$1.5 billion value generated by Intelligent Transport Systems annually, transport minister **Phil Twyford** says.

It will also help highlight the social benefits they create.

The value of the "T-Tech" industry was highlighted in a new report called Unlocking

Continued on page 27

Continued from page 26
Commercial Opportunities of
Intelligent Transport Systems
(ITS), released by Business NZ.

March 22

Battery degradation probed

Nissan says it's investigating allegations of excessive degradation in Nissan Leaf 30kWh batteries.

A thorough internal investigation is being held, Nissan New Zealand managing director John Manley told *The Listener* after it featured a story on the issue.

An automotive industry meeting is planned to discuss the matter and whether it is a global issue, first raised in a Flip the Fleet report.

March 26

Tourists share EV story

The New Zealand EV commu-

nity's enthusiasm and determination has inspired two French students during their seven-month "ecolectric" tour which started in January.

Heloise de Bokay and Solene Trinquet checked out the Leading the Charge EV road trip while in Nelson on March 20 and have shared New Zealand's EV story through their "News&Land" website and social media.

Nissan plans a million EVs a year

Nissan plans to launch increasing numbers of electrified vehicles, expand and evolve autonomous driving systems, and accelerate vehicle connectivity.

One target is to sell a million EVs a year by the 2022 financial year.

March 27

MITO supports school programme

EVelocity encourages secondary school student teams to design and build an electric vehicle – then race them in regional and national finals.

MITO is backing EVelocity's 2018 programme, chief executive Janet Lane says.

"We are focused on increasing the human infrastructure required for the widespread adoption of EVs in New Zealand."

Battery exchange for Leaf owners

Nissan Leaf owners in Japan can soon exchange old batteries for refabricated ones under a new, fee-based system.

The 24kWh refabricated batteries for the oldest Leafs will be offered for 300,000 yen apiece (NZ\$3893) – less than half of what a new 24kWh pack costs.

The carmaker plans to expand the line-up.

March 28

New plug-in the cheapest

Toyota New Zealand has launched the cheapest new plug-in vehicle available on the market – its Prius Prime model.

A single version is available at \$48,490 drive away, \$5500 less than the retail price of a Hyundai Ioniq plug-in hybrid.

AI changing the world

Artificial intelligence (AI) is changing the world.

Experts told more than 500 people at the AI-Day event in Auckland on March 28 just how the changes are being made.

AI applies to everyone, from individuals to businesses and projects like autonomous vehicles, they say.

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EV TALK DIARY

EVtalk Australia editor
Geoff Dobson looks at the month gone by on www.evtalk.com.au



March 7

EVs off Mahindra's list

Mahindra has ruled out its EVs for Australia, saying cost and lack of government incentives are the reason.

The brand's focus will remain on petrol SUVs and diesel light-commercial vehicles instead, Mahindra international operations chief Arvind Mathew says.

March 12

Proton battery rechargeable

The world's first rechargeable proton battery has been created by researchers at RMIT University in Melbourne, us-

ing carbon and water instead of lithium.

It could rewire how we power our vehicles, homes and devices, they say.

March 13

Greens outline EV plan

The Australian Green Party wants all of the country's new vehicle sales to be electric by 2030.

The Greens have put forward a proposal to ban the sale of new petrol and diesel cars in the next 12 years, along with other changes such as increasing the luxury car tax from 33% to 50% make EVs more affordable.

March 21

Satellite positioning evaluated

Satellite positioning is a major component of many connected and automated vehicle applications, especially needed for autonomous vehicles (AVs).

Usually known as GPS (global positioning system) or GNSS (global navigation satellite system), the accuracy of such systems in Australia and New Zealand is not as good as it could be.

Improved positioning services, such as satellite-based augmentation systems (SBAS), are midway through a two-year evaluation by the New Zealand and Australian governments.

March 23

Surge in EVs expected

Australia is about to get a surge in electric vehicles with more than 10 car brands launching

EVs there by the end of 2020.

March 27

Adelaide gets electric trash trucks

Rubbish collector East Waste is proposing a solar and wind energy run rubbish truck fleet for Adelaide's east and inner north.

The project, understood to be an Australian first, is expected to slash costs and reduce carbon emissions.

March 29

\$3.2b needed for infrastructure

The electric vehicle industry wants an extra \$3.2 billion spent on infrastructure to get three million EVs on Australia's roads by 2030.

The scenario was outlined in a new report for the Electric Vehicle Council, *The Australian reports.* ■

EV CHARGING LOCATIONS

bought to you by **AUTOHUB** your leading logistics team for Japanese and UK used EVs

Fast Charger Locations – North Island

Kaitia -	Te Ahu, 28 South Rd,	Ruakura -	Waikato Innovation Park, 9
Kerikeri -	1 Butler Rd	Melody Ln, Hamilton	
Kaikohe -	Library Carpark, 14 Marino Pl	Raglan -	43 Bow St
Kawakawa -	4 State Highway 1	Mt Maunganui -	Bayfair, 19 Girven Road, Mt
Tikipunga -	Paramount Plaza, 1 Wanka		Maunganui Rd
	St, Whangarei	Cambridge -	73 Queen Street
Whangarei -	Northpower Substation, 11	Te Awamutu -	10 Scout Lane
	Alexander St	Whakatane -	i-SITE, 30 Quay St
Raumanga -	McDonalds, 130 Tauroa St,	Opotiki -	i-Site, 70 Bridge St
	Whangarei	Te Kaha -	Te Kaha Beach Resort, 3
Dargaville -	Totara St Parking,		Hotel Rd, SH35
	113 Totara St	Rotorua -	1134 Haupapa St
Kaiwaka -	1 Kaiwaka-Mangawhai Rd	Matawai -	6522 Matawai Rd
Warkworth -	New World, 6 Percy St	Tolaga Bay -	43 Cook St (25kWh charger)
Warkworth -	BP Warkworth, 67 Auckland	Te Kuiti -	New World, 39 Rora St
	Rd (SH1)	Taupo -	Taupo Fire Station, 1
Orewa -	New World, 11 Moana Ave		Kaimanawa St
Silverdale -	Kings Plant Barn, 17 Hibiscus		Tesla Supercharger, 1
	Coast Highway		Kaimanawa St
Albany -	The Warehouse, 186 Don	Gisborne -	21 Gladstone Rd
	McKinnon Drive, Albany	Rangitaiki -	Rangitaiki Lodge Café,
Rosedale -	McDonalds, 14-16		3281 SH5
	Constellation Dr, Auckland	Turangi -	1 Pihanga Rd
Kumeu -	Kumeu New World, 120 State	New Plymouth -	66 Courtenay St
	Highway	Wairoa -	75 Queen St
Henderson -	Pak'n'Save, 224 Lincoln Rd,	Te Haroto -	Mc Vicar Rd, Napier-Taupo
	Auckland		Highway, 4237 SH5
Auckland -	21 Hobson St	Waiouru -	State Highway One &
Auckland -	Z Station, 150 Beach Rd		Hassett Dr
Hobson St -	Vector Substation,	Hawera -	Pak'n'Save, 54 Princes St
	21 Hobson St	Napier -	206 Dickens St
Beach Rd -	Z Station, 150 Beach Rd	Hastings -	100 Queen St W
Newmarket -	1 Gillies Ave, Auckland	Mangaweka -	2 Koraenui St
Greenlane -	McDonald's, 320/356 Great	Waipukurau -	34 Russell St
	South Rd, Auckland	Dannevirke -	248 Gordon St
Pakuranga -	BP Station, 322 Pakuranga	Woodville -	i-SITE, 43 Vogel St
	Rd, Auckland	Palmerston North -	i-SITE, 126 The Square
Botany Downs -	Z Station, 550 Te Irirangi Dr,	Palmerston North -	Tesla Supercharger, 365
	Auckland		Ferguson St
Auckland Airport -	Airport Shopping Ctr, 400	Otaki -	155-163 Main Hwy
	George Bolt Memorial Dr	Masterton -	3 Dixon St
Auckland Airport -	Z Skyway, George Bolt	Porirua -	2 Serlby Pl
	Memorial Dr	Featherston -	SuperValue, 42 Fitzherbert St,
Takanini Village -	30 Walters Rd, Auckland		Rimutaka Hill
Coromandel -	44 Woolams Rd	Upper Hutt -	24 Queen St, Upper Hutt
Whitianga -	4 Lee St	Lower Hutt -	Dowse Art Museum,
Tairua -	Tokoroa Rd Carpark, 6		1 Stevens Grove
	Tokoroa Rd	Petone -	Z Station,
Pukekohe -	King Street Carpark		60 Hutt Rd,
(Seddon Lane), 56-60 King St		Te Aro -	Lower Hutt
Pukekohe -	Counties Power, 14 Glasgow		Z Station,
	Rd (Business hrs only)		174 Vivian
Thames -	505 Mackay Street		St, Wellington
Whangamata -	100 Hetherington Road		
Te Kauwhata -	16 Wayside Rd		
Waihi -	New World, 35 Kenny St		
Te Rapa -	WEL Networks, 114 Maui St		
Hamilton -	Tesla Supercharger,		
	The Base, Te Rapa Rd &		
	Wairere Dr		
Hamilton -	Caro St Carpark, 7 Caro St		
Hamilton -	Pak'n'Save, Clarence St,		



Fast Charger Locations – South Island

Takaka -	16 Willow St
Nelson -	Millers Acre Carpark, 37-39 Halifax St E
Richmond -	Tasman District Library, 11 Mcglashen Ave
Greymouth -	13 Tarapuhi Street
Kaikoura -	51 West End
Culverden -	27A Mountain View Rd
Amberley -	Countdown, 123 Carters Rd
Northwood -	New World, 2 Mounter Ave, Christchurch
Harewood -	Raeward Fresh, 800 Harewood Rd, Christchurch
Addington -	Z Station, 40 Moorhouse Ave, Christchurch
Halswell -	New World, 9 Nicholls Rd
Rolleston -	New World, 90 Rolleston Dr
Lincoln -	New World, 77 Gerald St, Lincoln 7674
Little River -	4235A Christchurch Akaroa Rd
Rakaia -	Rolleston St
Ashburton -	109 West St
Tekapo -	Lake Tekapo Tavern, State Highway 8
Fairlie -	Opposite 53 Main St
Geraldine -	Cox St Carpark, 14 Geraldine-Fairlie Highway
Twizel -	Twizel Events Centre, 61 McKenzie Dr
Timaru -	26A North St, Timaru
Omarama -	4 Sutherland Rd
Kurow -	Wynyard St
Wanaka -	42 Ardmore St
Frankton -	302 Hawthorn Dr, Queenstown, 9300
Waimate -	125 Queen Street
Oamaru -	Eden St Carpark, 3 Eden St
Ranfurly -	31 Charlemont St E
Alexandra -	9 Thompson St, Bridge Hill
Hampden -	33 Lincoln St
Dunedin -	Filleul St Carpark, 193 Moray Pl
Roxborough -	22 Jedburgh St
Lawrence -	Four Square, 19 Ross Pl
Winton -	New World, 293 Great North Rd
Gore -	New World, 8 Irk St
Balclutha -	23 Charlotte St
Invercargill -	116 Esk St

