



The Future of Transport

Moderator: Phil Devon, Northern Beaches Council



Peter McLean

Bicycle NSW



Toby Hagon

Motoring journalist



Michael Day

Australian EV Association



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Department of Climate Change,
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Ausgrid



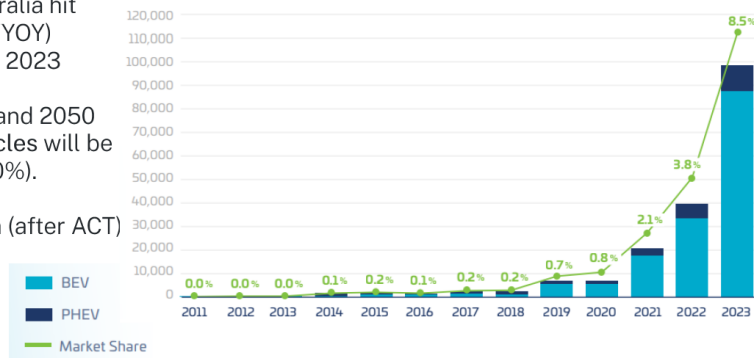
Our aim is to increase EV sales to more than 50 per cent of new cars sold in NSW by 2030. This means EVs will be the vast majority of new cars sold in the State by 2035.



EV Uptake Today



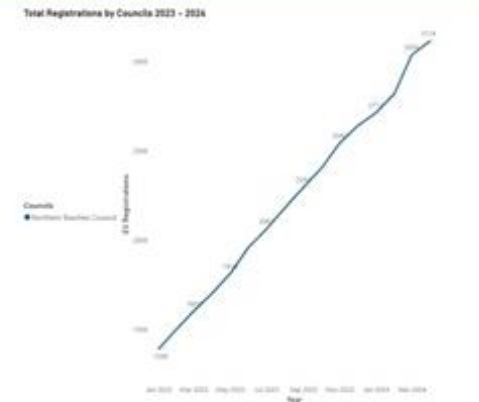
- Sales of new EVs in Australia hit 8.45% in 2023 (up 120% YOY)
- 98,436 new EVs in AU in 2023
- >180,000 EVs in AU
- Forecast between 2045 and 2050 >20 million electric vehicles will be on Australian roads (~100%). Currently at ~1%
- NSW leading in Australia (after ACT) with 9%



EV Uptake – Northern Beaches



- Jan 2023-1390
- Mar 2024-3114
- 124% increase
- **53,500 EV Registrations in NSW in 2023**



NSW EV programs and initiatives

EV Fleet incentives

\$105m

To support business and council fleets procuring EVs

100% new EVs in NSW Government fleet by 2030

\$33m to 24/25

Ultra-fast chargers will be installed at
5km intervals
along major roads in Sydney

Ultra-fast chargers will be installed at
100km intervals
along major NSW highways

\$20 million

in grants will be available
for tourism businesses to install
destination chargers

\$10 m

for kerbside charging

\$10 m
To make buildings
EV ready

VEOS + VESR



Barriers to EV Uptake



High upfront cost



Range anxiety/
charging
availability



Limited model
availability



Limited
information



Benefits to using EVs



Switching to an
electric vehicle
can save about
\$3,100
in running costs a year



Tailpipe emissions reduced
to provide **cleaner air**
and **health** benefits



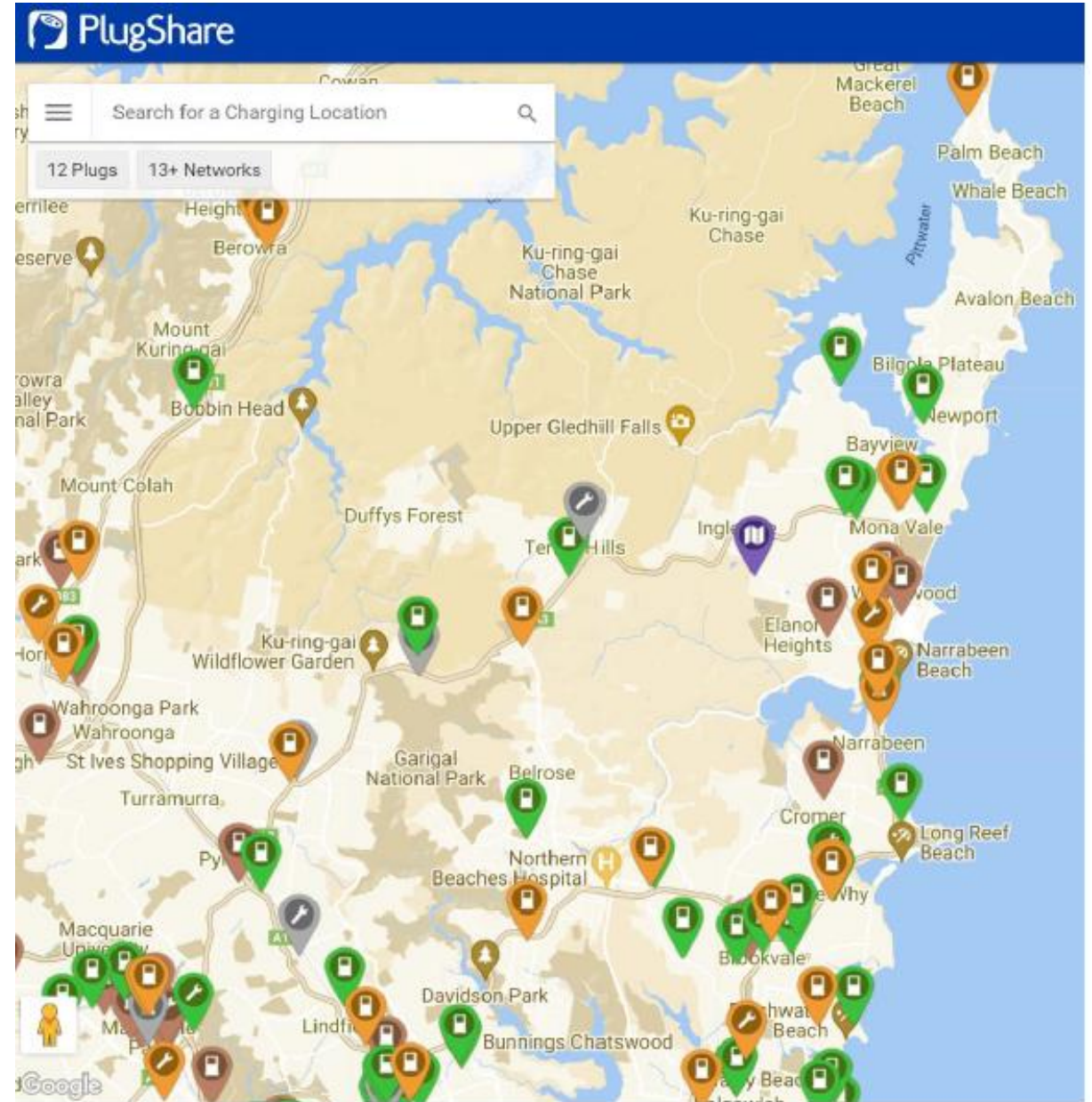
Quieter vehicles will help
improve **amenity of**
public and busy
spaces



Australia's abundance of
renewable energy will
ultimately **improve fuel**
security

1. Lower running costs
2. Lower greenhouse gas emissions; Cleaner air and health benefits
3. Quieter Roads
4. Improved fuel security; jobs
5. Fun!

Public EV chargers located across the Northern Beaches LGA



Vehicle Emissions Star Ratings (VESR)

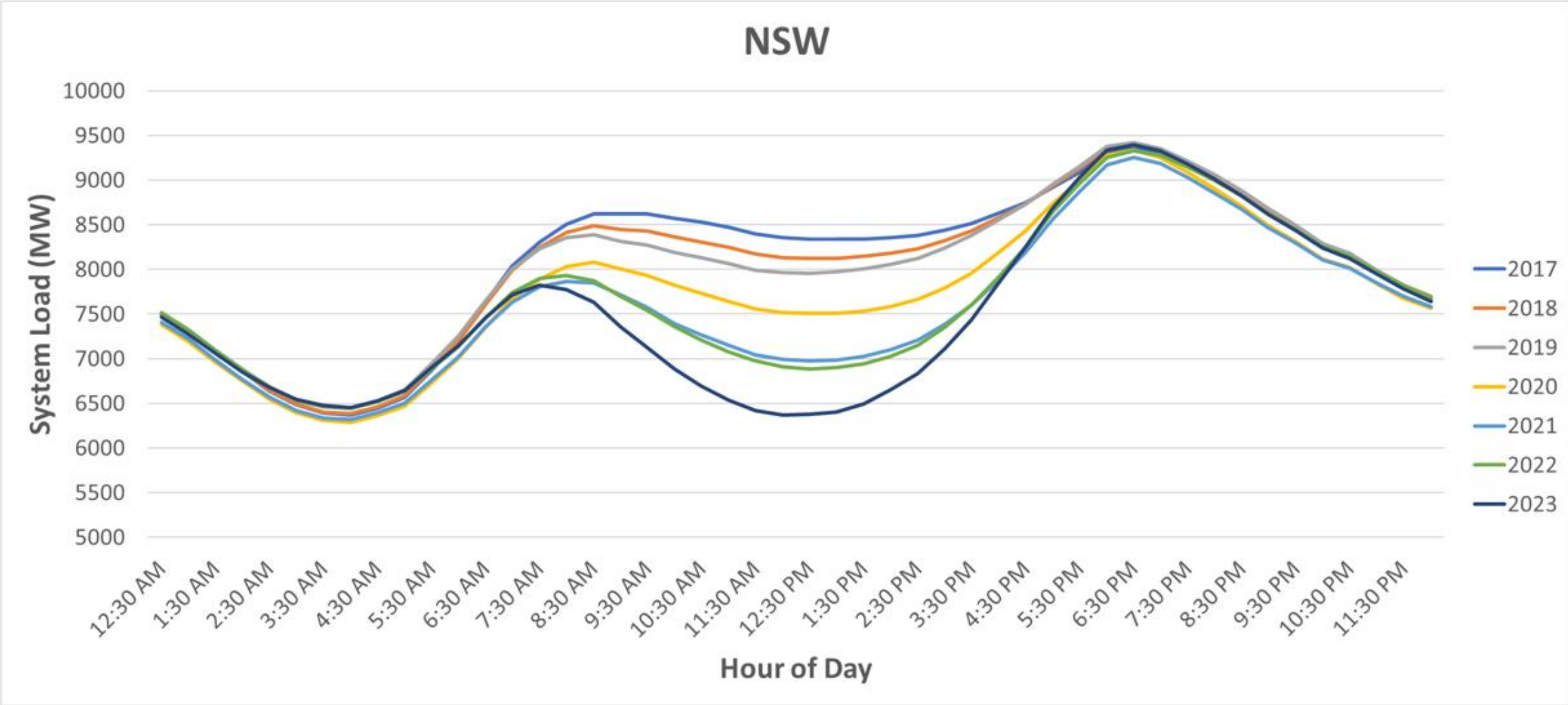


Overview:

- Launched last month
- Compare CO2 emissions of vehicles with star ratings
- Endorsed by the Commonwealth, and all state and territory governments
- All new and used light vehicles sold since 2004
- Excellent resource articles to help inform consumers and, hopefully, influence lower emission purchases



EV CHARGING - STRAIGHTENING OUT THE DUCK



JOLT



POLE MOUNTED CHARGERERS



Australian Electric Vehicle Association



Electronics Australia 1972

- Formed 1973 (time of OPEC oil crisis)
- Volunteer not-for-profit organisation
- Dedicated to electrifying Australia's transportation sector
- Branches in every Australian capital
- We are
 - EV Builders
 - EV Owners
 - EV Business Owners
 - EV Lobbyists/Advocates

Australian develops electric car

After 15 years work developing electric cars, Mr Roy Emmerton of Lower Hawkesbury, NSW, claims he has produced Australia's first high performance model. His prototype, a converted VW "Super Bug", is capable of 100mph and very impressive acceleration performance.

The motor used is a British made series type with slight compounding. It currently runs from a set of modified lead-acid batteries which deliver up to 150V. The batteries have modified plate connections for greater current capability, similar to a traction battery but lower in cost. The ultimate aim is to use sulphur sodium or catalytic reforming type batteries, or perhaps fuel cells, to provide higher performance and greater range.

The motor has a continuous rating of 10kW, and uses an interpolar structure to prolong brush life. The motor has already done 30,000 miles without brush replacement.

Control of the motor is by a thyristor switching circuit, using variable pulse width and rate. The motor has a maximum speed of 20,000rpm, which coupled with the flat torque characteristic allows a speed range of 0-100mph with a single gear ratio. No clutch or conventional gearbox is required.

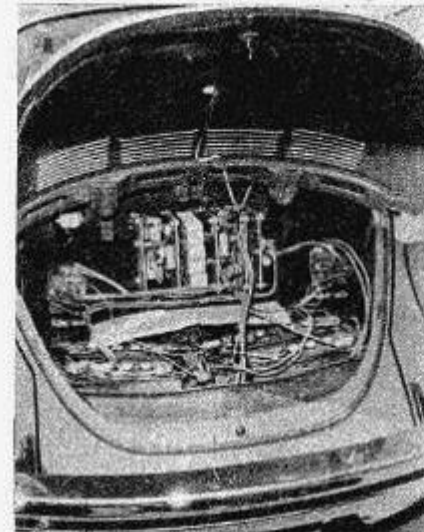
Pulsed regenerative braking is used, to improve efficiency and extend the range of the vehicle. Mr Emmerton is also working to incorporate a system to recover energy from the shock absorber system, using an oil motor and alternator. Typically this can extend range by at least as much as the gain from regenerative braking.

Present range of the car is 50 miles before needing a 45 minute recharge. When higher energy density batteries are used, this will be extended to 300 miles.

The present maximum speed can be increased to 150mph by increasing the battery voltage to 250V. This would also allow transformerless recharging from the mains.

Current aim of Mr Emmerton is to produce similar vehicles in commercial quantities, using bodies made in co-operation with an Australian manufacturer. All that is needed is enthusiastic financial backing.

— Jane Ford.



Above is Roy Emmerton with his converted VW "Super Bug". At left is a close-up of the engine compartment, showing the motor, batteries and control circuitry.

2023 Tesla Model 3



2022 Skyblue ET



Michael Day

AEVA NSW Branch Chairman

AEVA National Treasurer

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1989 Toyota MR2 EV



2010 Vmoto Emax EV



2002 Lotus Elise EV (under construction)

HOW FAST CAN I CHARGE MY EV?

LEVEL 1

AC **2 kW**

Full charge
34 hours



Also known as “trickle charging”, Level 1 is the slowest. Every EV model can plug into a regular wall outlet so there’s no need to buy a charger. An eight-hour overnight charge should provide around 90 kilometres of driving.

LEVEL 2

AC **7.2 kW**

Full charge
12 hours



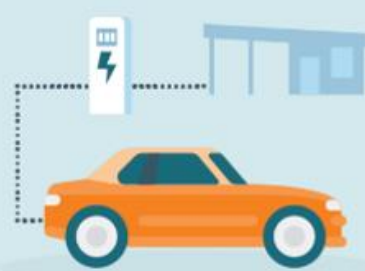
Level 2 is commonly used for everyday charging. Many users install a Level 2 charger at home because it will fully charge the vehicle overnight, even if the battery is nearly empty.

LEVEL 3

DC **50 kW** to **350 kW**

10-80% in
73 minutes

10-80% in
18 minutes



Level 3 “fast” chargers start at 50kW and go all the way up to 350kW. The required voltage is much higher than Level 1 & 2 charging, which is why Level 3 chargers are unsuitable for most homes.



“Ultra-fast” 350kW charging is the most rapid type of charging available. Only a few vehicle models can charge at this maximum rate, and can only do so under very specific environmental conditions.

HOW TO WORK OUT EV CHARGING TIMES FOR DISTANCE

kW = km from 10 min charging. e.g. 100kW = 100km in 10 minutes

Note: Based on a Hyundai Ioniq6 (77.4kWh battery) Charging times may increase if peak charging rates are not achieved. Maximum charging rate is subject to factors such as charger condition, power source reliability and environmental conditions.

My Home Charging - Simple

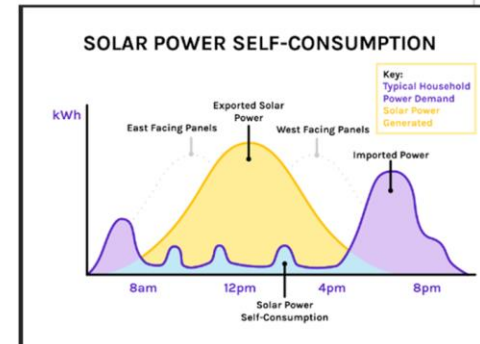
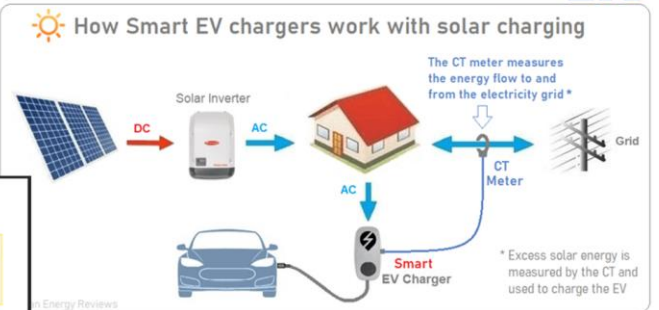


- Average drive – 40km
✓ Charge time ~ 1 hour
- Long drive – 140km
✓ Charge time ~ 4 hours

Tesla Mobile Charger = 7kw
(10kWh = 50-80 km range)



My Home Charging - Smart



Out of Home EV Charging





Buying an EV

- Affordability
- Brands
- New vehicles coming soon
- The state of the used EV market
- Battery longevity / battery fires

Safety considerations when selecting an e-bike?

1. Choose the right bike type based on your needs both now and in 2 years time.
2. Calculate how much you want to spend.
3. Make sure your bicycle fits you, try different brands and consider hiring one first.
4. Look at the detail and fine print, for example gears, materials, brakes and other components, warranties etc.
5. Check if it's a legal e-bike, does it meet standards and regulations.
6. Ask questions and then some more questions.
7. Do a test ride and reconsider all of the above.

Types of e-bikes: touring, cruising, retro, mountain bike and e-cargo bikes



E-bike safe charging tips?

Recharging your e-bike:

- Only use AS/NZS (60335.2.29) chargers designed for your e-bike
- Do not modify your e-bike, especially the charging and battery system
- Be very careful charging e-bike batteries with no EU or other standard. Do not charge unattended.
- If any lithium battery is damaged, swollen or overheating then do not charge and ensure the item is checked by a professional.
- When is the best time to recharge my e-bike? (range, distance and capacity)
- How long do batteries last; can they be exchanged/recycled?



Safe Bicycle Riding and Trip Planning?

Safe Bicycle Riding:

- Wear a helmet (including passengers)
- Try to wear bright clothing (and/or get a bright helmet)
- Follow the road rules
- Shared paths and shared zones are SHARED!
- Check your brakes, wheels, tires, gearing and lights (ABCDS Test)
- Consider insurance (including property, public liability and personal accident)

Trip Planning:

- Use online tools (Council website, google and TfNSW)
- Best option is to test ride your planned route on a weekend or in spare time
- For multimodal travel, see where is the best location to lock your bicycle
- Lock your bicycle in a suitable place with suitable lock(s)
- Test out different times and routes (show others)

Northern Beaches **Walking Plan**



northern
beaches
council



Safe Cycling Network

Layer List

Layers

▼ ☒ Safe Cycling Route Hierarchy

▼ ☒ Tier 1 - Regional Routes

— Existing Network

- - Proposed Network

▼ ☒ Tier 2 - District Routes

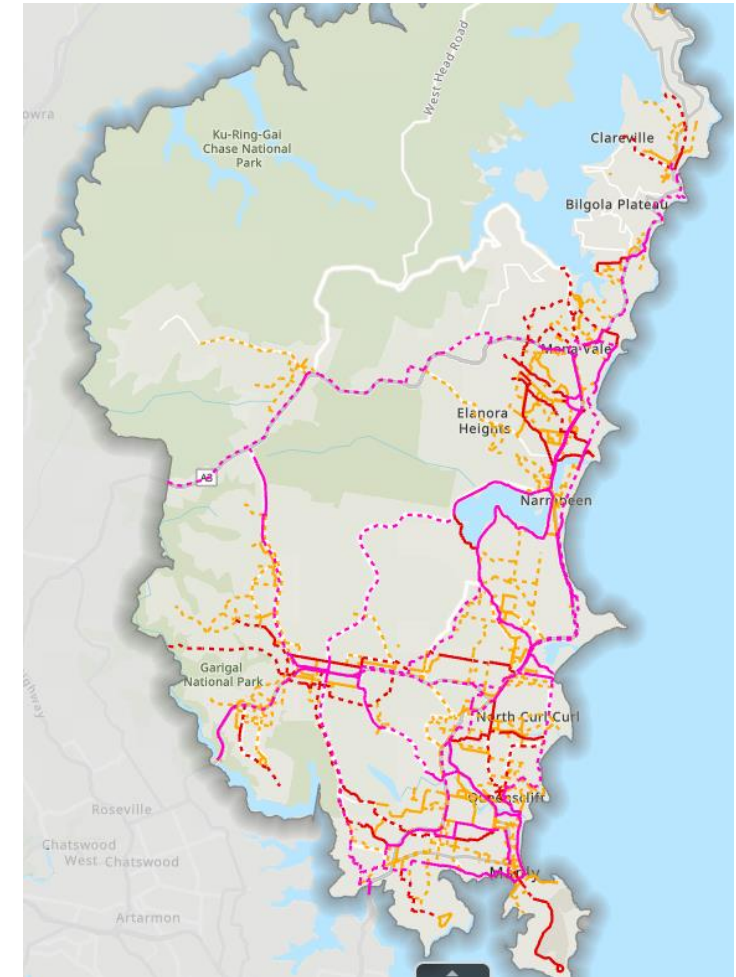
— Existing Network

- - Proposed Network

▼ ☒ Tier 3 - Local Connections

— Existing Network

- - Proposed Network



The Future of Transport : Thank You

- Many thanks to the moderator and panellists for supporting Council's first Net Zero event – it's very much appreciated.
- Thank you also to the audience for joining us. We hope this panel discussion has inspired you.

