



Australian Electric Vehicle Association

AEVA POLICY RECOMMENDATIONS: MASS TRANSIT – RAILWAYS, TRAMS, BUSES & FERRIES APPROVED BY THE BOARD: 17 JULY 2025

Policy statements

- [1]** AEVA recommends state and territory governments continue to invest in the full electrification of bus services. Regional coach services should also be delivered by battery electric buses, ensuring the benefits of EVs are extended to those who cannot travel by car.
- [2]** AEVA recommends investing in suitable Battery Electric Multiple Units¹ (BEMUs) for key regional rail services, and supporting local rolling stock fabrication.
- [3]** AEVA recommends continued expansion of electric suburban rail services in cities, along with further investments in new light rail services.
- [4]** AEVA recommends transformational investment in upgrading major intercity rail links so that regular, high-speed passenger rail services may flourish. Lines should be upgraded to high tonne-per-axle rail with minimal curve radii and duplicated in most places to ensure high quality passenger services.
- [5]** AEVA recommends overhead electric lines be installed on key, high-traffic rail routes linking the eastern seaboard, primarily Melbourne-Canberra-Sydney-Newcastle-Brisbane using standard 25 kV equipment. Electrification of the east coast by 2050 is an achievable goal.
- [6]** AEVA supports the electrification and expansion of electric ferry services. These ferries support high speed commuter transport along key waterways such as those found in Brisbane, Hobart, Perth and Sydney. They can also support combined vehicle and passenger services such as those supporting many of the island communities found around the Australian coast.

¹ An electric multiple unit (EMU) is a multiple car trainset where each car has its own electric propulsion. There is no locomotive pulling unpowered cars.

Commentary

While a single freeway lane can move roughly 2,500 vehicles per hour, electric rail can transport ten times as many people in the same timeframe. Electric mass transit represents one of the most efficient ways of using electricity to move large numbers of people. The low rolling resistance of steel wheels on rails compared to rubber on bitumen means less energy is required per kilometre travelled, while the corridor is generally constructed such that inclines are mild and turns are gentle, further improving efficiency. The cost of railway maintenance is also lower per kilometre than roads.

Before the COVID-19 pandemic, electric trains were responsible for almost 18 billion passenger-kilometres travelled every year in Australia. Suburban commuter rail networks in Brisbane, Sydney, Melbourne, Perth and Adelaide are the unsung heroes of electric land transport, moving millions of passengers each week using electricity from a grid which is only getting cleaner. Since 2011, the average emissions intensity of electricity in the National Electricity Market has fallen from 900 g CO₂-e/kWh to 600 g CO₂-e/kWh and is projected to fall substantially further by 2030. Even more passenger-kilometres are delivered by buses, however these run mainly on diesel and compressed natural gas.

Electric trains and trams generally use overhead wires, meaning no traction batteries are required. However, battery locomotives and battery electric multiple units are employed around the world, with many able to be recharged using the overhead network. Similarly, battery electric buses are now the only motive power version being manufactured in China and are becoming a key focus of state governments in Australia. Some buses may even use the same overhead power as electric trams (typically 600 V DC), however in Australia electric buses are expected to be mainly battery electric with conventional charging. Ultimately the use of traction batteries will be a matter of economics: the cost of the batteries versus the cost or difficulty of constructing overhead wiring.

Electric passenger rail remains Australia's most popular EV, and in most cities expansions are well underway: Metronet in WA, electrification of remaining lines in Adelaide, the Suburban Rail Loop in Melbourne, and several new lines in Sydney and Brisbane. Queensland has been operating a twice-daily electric rail service from Brisbane to Rockhampton since 1998. Intercity rail and road coach services provide a crucial link for certain groups in the community: young people who are not yet old enough to obtain a driver's license, low income households, pensioners, and people with a disability frequently rely on these services to attend school or university, attend medical appointments, or to visit friends and relatives. Poor investment in these services citing low patronage has only resulted in more infrequent and slow services, which further turns passengers away. Significant investment is required.

Reassuringly, the Federal Government has established the [High Speed Rail Authority](#) which will oversee planning and corridor works primarily around Sydney, but hopes to extend its scope to Brisbane, Canberra and Melbourne. Rail services need not even be 'high speed'. A recent evaluation of the Sydney-Melbourne rail line found several key track realignments across the Great Dividing Range, along with track duplication, would slash hours off the trip using existing rolling stock. Electrification of this key corridor (with a branch to Canberra)

would be transformative. The cost of such an upgrade would be a fraction of a new high speed rail corridor and could be implemented within a few years. As the line shares services with freight trains, their service schedule would be vastly improved too. Regional passenger rail has been studied extensively by the Federal Government, but frustratingly, little progress has been made.

Faster and more frequent rail services linking Adelaide and the eastern seaboard could significantly reduce road traffic on the Princes, Hume and Pacific highways. Reports of long queues at EV fast chargers during holiday periods are a reminder that long-distance travel by EV will require massive investments in charging and supporting infrastructure. Currently rail, tram and bus passenger movements amount to less than 10% of road traffic volumes.

If reducing transport-related greenhouse gas emissions in Australia is a core goal, these patronage figures must increase. Electrification of metropolitan bus services will see substantially reduced air pollution and improvements to public health. Early efforts to electrify municipal bus fleets in Australia have identified charging infrastructure as a bottleneck to rapid uptake. Planning for EV bus fleets requires careful, comprehensive planning to accommodate bus charging. Many cities overseas including in China have successfully integrated large numbers of electric buses into their fleets using smaller, more geographically distributed depots which reduces the demand for a lot of electric power in one location. When confronted with a bus replacement, state governments should today find the economics of electric buses highly compelling.

The success or otherwise of an urban mass transit network is highly dependent on numerous other planning decisions. Efforts must be made to integrate mass transit plans with the longer term growth strategy of a city.

Battery electric multiple units (BEMUs) may prove valuable in decarbonising several regional rail services. The Prospector in WA, V/Line in Victoria and the Trainlink network in NSW all serve communities hundreds of kilometres from the city centre using diesel locomotives. While some high-traffic lines may easily be electrified with overhead power, many would be uneconomical. A battery-electric hybrid train may recharge and operate using overhead power in the city and switch to battery only further afield.

Electric ferries are becoming increasingly popular as a sustainable transportation solution for waterways with state governments already proposing new services in Sydney and Perth. These ferries utilise electric propulsion systems powered by batteries, offering a cleaner, quieter, and more efficient alternative to traditional diesel-powered ferries. Hydrofoil models are also considered a step change in technology, offering increased speeds and a smoother ride including in rough waters all whilst reducing drag and energy consumption as well as creating less bank-damaging wake.

Australia is also blessed to be home to [INCAT](#), the manufacturer of the largest electric ferry in the world, the China Zorrilla which will operate between Buenos Aires, Argentina and Uruguay. This demonstrates that the energy transition should be seen as an economic opportunity for Australian workers.