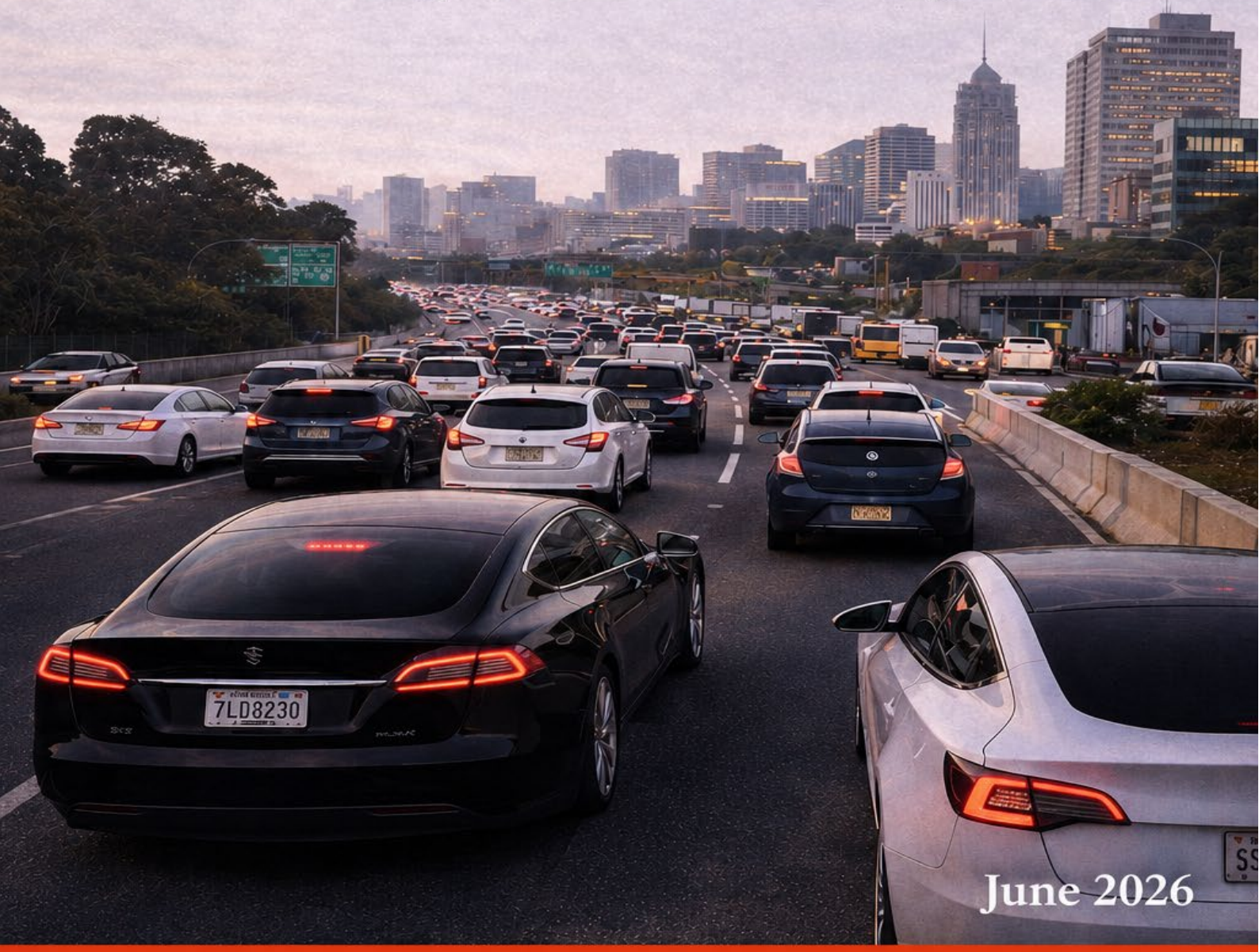
THE UNIVERSITY OF SYDNEY

IV: An Electric Traffic Jam Is Still a Traffic Jam

Decarbonising vehicles is not enough



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Acknowledgement of Country

We recognise and pay respect to the Elders and communities – past and present – of the lands that the University of Sydney's campuses stand on. For thousands of years, they have shared and exchanged knowledges across innumerable generations for the benefit of all.

Australia has fallen in love with a comforting idea. If we electrify the fleet, the transport problem solves itself.

No more tailpipes. Cleaner air. Renewable energy charging our cars. The transition appears elegant and technological. Replace the engine, keep the system.

But here is the inconvenient reality. Even if every car on Australian roads became electric tomorrow, we would still have congestion, sprawl, road trauma, infrastructure strain and staggering land devoted to parking. We would still design cities around vehicles instead of people.

Electrification is necessary. It is not sufficient.

Transport produced about 90 million tonnes of carbon dioxide equivalent in 2022, accounting for roughly 21 percent of Australia's national emissions, according to the Climate Change Authority (2024). On road vehicles dominate the sector, contributing about 85 percent of transport emissions.

That statistic is often used to justify rapid electrification of private vehicles. Fair enough. But there is another way to read it. If the overwhelming majority of transport emissions come from on road vehicles, then the total distance travelled matters as much as the fuel source.

Vehicle kilometres travelled have grown steadily over time. Population growth, urban expansion and planning decisions that separate housing from employment have increased average trip lengths. Even as engines become more efficient, total driving has expanded.

Electrifying a system built on ever increasing kilometres locks in more than emissions. It locks in congestion and land use patterns that are difficult to unwind.

An electric car still occupies the same road space as a petrol vehicle. It still requires parking at home, at work and at shops. It still contributes to peak hour gridlock. It still demands raw materials for manufacturing, including steel, aluminium and battery minerals. It still requires public spending on roads and maintenance.

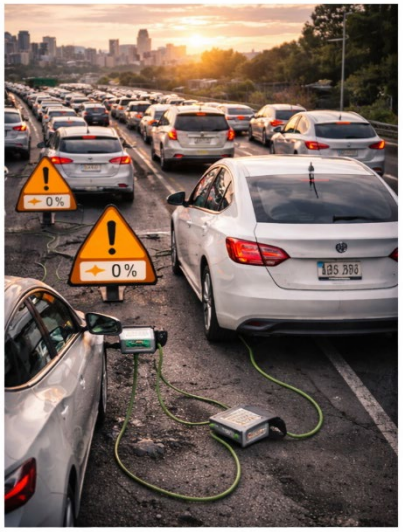
There is also an energy dimension. While Australia's electricity grid is decarbonising, it is

not yet zero emissions. More electric vehicles mean more electricity demand. That is manageable, but only if grid upgrades keep pace. Rapid growth in vehicle charging without parallel planning risks local network strain and inequities in access.

None of this is an argument against electric vehicles. It is an argument against magical thinking.

The deeper question is whether Australia is prepared to address transport demand, not just transport technology. Demand reduction does not mean banning cars or shaming drivers. It means designing systems that reduce the need for long, frequent car trips.

Congestion pricing is one example. Charging vehicles for peak hour road use reflects the reality that road space is scarce. Cities around the world have demonstrated that well designed congestion pricing can reduce traffic volumes and improve travel times without crippling economic activity.



Parking reform is another. Minimum parking requirements in planning codes encourage car dependence by making developments auto centric. Reducing or eliminating such mandates near high quality public transport can shift travel patterns over time.

Public transport investment is critical, but not just megaprojects. Frequent, reliable bus networks supported by dedicated lanes can move large numbers of people efficiently. Bus rapid transit systems are often cheaper and faster to implement than rail extensions.

Active transport matters too. Many urban trips are short enough to walk or cycle if safe infrastructure exists. When cycling networks are continuous and protected rather than fragmented, usage increases. Short trips shifted away from cars reduce congestion for everyone else.

Land use planning may be the most powerful lever of all. When housing is located far from employment centres, car dependence becomes structural. Encouraging mixed use development and infill near transport corridors shortens average trip distances and makes alternatives viable.

These policies are politically harder than electrification subsidies. They challenge habits and expectations. They redistribute road space. They require coordination across levels of government.

Electrification, by contrast, allows us to preserve the familiar while changing the engine. But preservation has costs.

Consider road trauma. Australia still records thousands of serious injuries and hundreds of fatalities on roads each year. Electric vehicles may reduce some risks through advanced safety systems, but they do not eliminate the fundamental danger of high speed, high volume traffic environments.

Consider urban heat. Large expanses of asphalt and parking lots contribute to heat island effects. Electric drivetrains do not cool cities.

Consider household budgets. Car ownership is expensive, encompassing purchase price, insurance, registration, maintenance and depreciation. For many households, transport is

one of the largest expenses after housing. Reducing reliance on private vehicles can free income for other priorities.

The debate is often framed as binary. Either you support electric vehicles or you oppose climate action. That is a false choice.

The more honest framing is this. Electrification addresses emissions intensity per kilometre. Demand management addresses total kilometres travelled.

Both matter.

If Australia electrifies rapidly while continuing to expand highways, extend sprawl and subsidise parking, we risk creating a lower emissions version of the same inefficient system. Congestion persists. Infrastructure costs rise. Energy demand grows.

The alternative is more ambitious. Electrify the fleet while simultaneously reducing unnecessary driving. Align housing with transport. Price road use intelligently. Invest in high frequency public transport. Build active travel networks that function as networks, not decorations.

Such an approach recognises that transport is not simply about moving vehicles from one point to another. It is about shaping how people live, work and connect.

An electric traffic jam still wastes time. It still consumes space. It still reflects a planning model that assumes driving is the default.

Sustainability is not achieved by swapping engines and declaring victory. It requires rethinking the system that made those engines necessary in the first place.

Australia has an opportunity to do both. Embrace electrification and redesign mobility.

If we only do the first, we will discover that cleaner cars alone cannot deliver cleaner cities.

References

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Sustainable Transport Series

About the authors of this series

John rejoined the Institute of Transport and Logistics Studies as the Neil Smith Research Chair in Sustainable Transport Futures in October 2022, after an 8-year absence. Over the course of his academic career, John has published over 300 scientific articles in peer-reviewed journals, books, and conference proceedings. He has also been an Associate Editor of Transportation, and Co-Editor and Chief of the Journal of Choice Modelling and Transportation Research Part A. He has also held various roles on multiple conference committees both in Australia and overseas.

Since graduating with a PhD, John has been obtained numerous grants worth over $3.4 million. These include a number of ARC discovery grants in the areas of Public Health, Transportation crowding, general economic theory related to utility separability as well as one on improving the external validity of Discrete Choice Experiments. In addition to academic grants, John has been involved in $9 million in industry-based contract research since the year 2005. Find out more about John: https://profiles.sydney.edu.au/john.rose

Andrea joined the Institute of Transport and Logistics Studies as the Neil Smith Lecturer in Sustainable Mobility and Accessibility in March 2023. Before becoming a lecturer, Andrea spent three years as visiting research scholar thanks to two scholarships, the Early.Postdoc mobility and the Postdoc mobility, awarded by the Swiss National Science Foundation. Andrea holds a Master of Science in Statistics with Honors from the University of Bologna and a PhD in Economics from the University of Lugano. Over the years, Andrea has taken part in different consulting projects with several public and private institutions such as NSW Government, University of Florence, and University of Catania. Find out more about Andrea: https://profiles.sydney.edu.au/andrea.pellegrini

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