

Green Cars, Fewer Cars? Singapore's EV Dilemma

Introduction

Under the 2015 Paris Agreement, Singapore was committed to reach net-zero emissions by 2050. Between April 2024 and March 2025, land transport was the third-largest source of carbon emissions, accounting for 15% of Singapore's total emissions.¹ As such, electrifying the vehicle population was central to decarbonising Singapore's land transport in order to reach its climate goals.

Progress in this area was promising. Land transport emissions had declined steadily since they peaked in 2016, well ahead of an initial 2030 timeline. In March 2022, Singapore's Land Transport Authority (LTA) set a target for an 80% reduction in land transport emissions from that 2016 peak "by or around mid-century".²

PowerEveryMove, the national electric vehicle (EV) campaign, was launched later that month to "boost the momentum" of electric vehicle adoption.³ The campaign aimed to raise awareness of the environmental benefits of EVs over conventional vehicles, as well as ongoing government initiatives to improve EV charging infrastructure. This effort dovetailed with the LTA's Land Transport Master Plan 2040, which planned for all vehicles in Singapore to run on cleaner energy by 2040.⁴

On the surface, Singapore's push for greater adoption of EVs seemed to contradict its longstanding stance to discourage private vehicle ownership. Since the early days of Singapore's urban planning, the government had continually expanded policies to curb private vehicle ownership in favour of public transport.⁵

This case study will analyse how Singapore's EV policies and car population control interact, where tensions arose, and the challenges of transport decarbonisation in a land-scarce city-state.

Background: Competing Policy Logics

Electric Vehicles and Decarbonisation

Globally, fossil fuels remained the dominant energy source for the transport sector. Moreover, road transport alone accounted for almost four-fifths (76%) of total carbon emissions from the broader

¹ *Sustainability Report 2024/25* (Land Transport Authority, 2025), [https://www.lta.gov.sg/content/dam/ltagov/who we are/statistics and publications/report/pdf/LTA_SR2425.pdf](https://www.lta.gov.sg/content/dam/ltagov/who%20we%20are/statistics%20and%20publications/report/pdf/LTA_SR2425.pdf).

² "Reducing Peak Land Transport Emissions by 80%", Land Transport Authority, March 8, 2022, <https://www.lta.gov.sg/content/ltagov/en/newsroom/2022/3/news-releases/reducing-peak-land-transport-emissions-by-80-.html>.

³ S Iswaran, "Launch of the National Electric Vehicle Campaign "Power Every Move: Towards An EV-Ready Future"" (speech, Singapore, March 29, 2022), Ministry of Transport, <https://www.mot.gov.sg/news-resources/newsroom/speech-by-minister-for-transport-mr-s-iswaran-at-the-launch-of-the-national-electric-vehicle-campaign-power-every-move-towards-an-ev-ready-future/>.

⁴ *Land Transport Master Plan 2040* (Land Transport Authority, 2019), [https://www.lta.gov.sg/content/ltagov/en/who we are/our work/land transport master plan 2040.html](https://www.lta.gov.sg/content/ltagov/en/who%20we%20are/our%20work/land%20transport%20master%20plan%202040.html).

⁵ *Creating Liveable Cities Through Car-Lite Urban Mobility* (Centre for Liveable Cities, Singapore and Urban Land Institute, 2016), <https://isomer-user-content.by.gov.sg/50/9747a70f-a6e3-4bd1-9fa0-848534c43ad4/carlite-urban-mobility-finalreport.pdf>.

This case has been written by Ruby Thiagarajan under the guidance of Hawyee Auyong, Lee Kuan Yew School of Public Policy (LKYSPP), National University of Singapore and has been funded by the LKYSPP. The case does not reflect the views of the sponsoring organisation nor is it intended to suggest correct or incorrect handling of the situation depicted. The case is not intended to serve as a primary source of data and is meant solely for class discussion.

transport sector.⁶ The electrification of road transport – replacing internal combustion engine (ICE)-based drivetrains with electric motors – had the potential to significantly mitigate road transport's environmental impact and represented the “primary pathway to zero emissions”.⁷

However, EVs were not entirely free from emissions at the systems level. Depending on how electricity was generated, fossil fuels could still be used to create the electricity to charge EVs. In Singapore's case, given that 94.3% of the country's 2023 power generation fuel mix came from natural gas, EVs in Singapore still overwhelmingly – if indirectly – ran on fossil fuels.⁸ Nevertheless, EVs produced fewer carbon emissions than ICE cars even when powered by carbon-intensive electric grids because they were more energy efficient overall;⁹ even if their full environmental benefits could not be realised without also decarbonising upstream energy sources.¹⁰

Unfortunately, EV batteries were more material-intensive than combustion engines.¹¹ As such, just replacing all ICE vehicles with EVs would not be enough. Instead, truly sustainable transport policies involved shifting demand onto public transit modes like buses and trains, which could carry many more passengers than privately owned EVs, and which had significantly lower life cycle emissions.¹² According to 2022 government estimates, travelling by an electric car, electric bus or train cut carbon emissions by 50%, 70%, or 90% respectively compared to the baseline of driving an ICE vehicle.¹³

Controlling Private Vehicle Population in Singapore

Land scarcity is very much a factor shaping the overall vision of transport for Singapore.

There is a role for private transport as a complement to public transport, which must remain the main mode of transport for the daily commute. Our policies on car ownership and taxis are shaped by these considerations. Unlike countries that are far less land-constrained, there is a real limit to how many cars we can accommodate on our roads.

- Minister for Transport Raymond Lim¹⁴

⁶ *Renewables 2025 Global Status Report Collection* (REN 21, 2025), <https://www.ren21.net/gsr-2025/sectors/transport/>.

⁷ Council of Engineers for the Energy Transition, *Comprehensive Catalog on Transportation Decarbonization* (UN Sustainable Development Solutions Network, 2024), https://files.unsdsn.org/CEET%20Brief_Catalog%20Transportation%20Decarbonization.pdf.

⁸ “What Could Singapore's Energy Mix Look like in 2035?”, Singapore EDB, January 4, 2024, <https://www.edb.gov.sg/en/business-insights/insights/what-could-singapores-energy-mix-look-like-in-2035.html>.

⁹ Andrew Moseman, “Are Electric Vehicles Definitely Better for the Climate than Gas-Powered Cars?”, *MIT Climate Portal*, October 13, 2022, <https://climate.mit.edu/ask-mit/are-electric-vehicles-definitely-better-climate-gas-powered-cars>.

¹⁰ Lih Wei Yeow et al., “Life Cycle Greenhouse Gas Emissions of Alternative Fuels and Powertrains for Medium-Duty Trucks: A Singapore Case Study”, *Transportation Research Part D: Transport and Environment* 105 (April 2022): 103258, <https://doi.org/10.1016/j.trd.2022.103258>.

¹¹ Iris Crawford, “How Much CO₂ Is Emitted by Manufacturing Batteries?”, *MIT Climate Portal*, August 8, 2025, <https://climate.mit.edu/ask-mit/how-much-co2-emitted-manufacturing-batteries>.

¹² Alexandre Milovanoff, “The Myth of Electric Cars: Why We Also Need to Focus on Buses and Trains”, *The Conversation*, October 21, 2020, <https://theconversation.com/the-myth-of-electric-cars-why-we-also-need-to-focus-on-buses-and-trains-147827>.

¹³ Wen Wei Cheong et al., “Green Transport in Singapore: Public Attitudes, Intentions and Actions”, *ETHOS*, August 2022, <https://knowledge.csc.gov.sg/ethos-issue-24/green-transport-in-singapore-public-attitudes-intention-and-actions>.

¹⁴ Raymond Lim, “Land Transport” (speech, Official Report of the Parliament of Singapore, 9 March 2007), Official Report (Hansard), Parliament of Singapore, 9 March 2007.

Beginning in the 1960s, the government implemented multiple measures to manage car ownership numbers considering Singapore's small size and high population density. "Excessive reliance" on private cars would have created untenable, debilitating traffic jams given the limited space for roads.¹⁵

Singapore's transport development strategy responded to traffic congestion "in both directions" – by increasing supply through developing transportation infrastructure and by decreasing travel demand.¹⁶ Urban planners established a comprehensive road and rail system through "strategic land use and transportation" plans that anticipated urban development needs 4 to 5 decades into the future¹⁷ and town planning promoted public transportation ridership at the municipal level. Locating essential facilities and services within municipal estates reduced the need for residents to travel longer distances.¹⁸ Even so, the *Land Transport Master Plan 2013* set a target for 8 in 10 households to be located within a 10-minute walk from a mass rapid transit (MRT) subway station to facilitate longer distance commutes.¹⁹ At the same time, policies targeting vehicle growth and disincentivising road usage were progressively introduced to manage the demand for car ownership.

In 2014, the *Sustainable Singapore Blueprint* presented a "car-lite" vision for Singapore as part of a framework to guide the country's sustainability efforts until 2030.²⁰ This would be achieved through "efficient and accessible rail and bus networks, streets and paths" that were "conducive for walking and cycling, and smart, on-demand point-to-point transport options". Singapore's strategy of combining public transit incentives with private vehicle ownership disincentives yielded "synergistic" outcomes in managing travel demand and helped maintain mobility as an accessible public good.²¹ In contrast, car ownership in Singapore had long been positioned as a "luxury" due to it being a "limited and non-basic resource".²²

The Inherent Tension

Some were concerned that the electrification of private transport would complicate – rather than resolve – the fundamental challenges in Singapore's transport policy. In a 2021 interview, then-Transport Minister Ong Ye Kung cautioned that Singapore "must be careful not to go overboard" in promoting wider adoption of EVs.²³ He saw public transport as the better and more sustainable strategy for managing road congestion and pointed out that EVs that might not "actually [be] that environmentally friendly", given that they needed large batteries that were difficult to dispose of.

¹⁵ Clarice Chow, Jean Chia, and Mina Zhan, *Integrating Land Use & Mobility: Supporting Sustainable Growth*, First edition (Singapore: Centre for Liveable Cities, Singapore, 2018).

¹⁶ Trinh Dinh Toan et al., "Travel Demand Management Policies: A Case Study of Singapore and Transferability Potentials for Hanoi", *Case Studies on Transport Policy* 11 (March 2023): 100934, <https://doi.org/10.1016/j.cstp.2022.100934>.

¹⁷ Melissa Sapuan, "Managing Singapore's Land Needs", *ETHOS*, April 2007, <https://knowledge.csc.gov.sg/ethos-issue-02/managing-singapores-land-needs/>.

¹⁸ Mi Diao, "Towards Sustainable Urban Transport in Singapore: Policy Instruments and Mobility Trends", *Transport Policy* 81 (September 2019): 320–30, <https://doi.org/10.1016/j.tranpol.2018.05.005>.

¹⁹ PricewaterhouseCoopers LLP, *The Singapore Land Transport Master Plan 2013 – A Review by PwC* (2013), https://www.pwc.com.sg/en/publications/assets/ltm_masterplan_201311.pdf.

²⁰ <https://www.nccs.gov.sg/media/publications/sustainable-singapore-blueprint/>

²¹ Trinh Dinh Toan et al., "Travel Demand Management Policies".

²² Parliament of Singapore, "Impact of Zero Car Growth Policy on COE Prices", Singapore Parliamentary Reports, Vol. 94, November 6, 2017.

²³ Yufeng Kok, "Public Transport Still More Sustainable than Electric Vehicles: Ong", *The Straits Times*, March 13, 2021, <https://www.straitstimes.com/singapore/public-transport-still-more-sustainable-than-electric-vehicles-ong>.

Moreover, even if they were less pollutive, EVs would still occupy the same scarce road space as ICE vehicles.

The LTA conducted several studies between 2021 and 2022 to understand the public's willingness to embrace greener transport options. The report (*Green Commuting Among Youths*) found that 43% of youths had "no initial car ownership aspirations" and that 58% of youths who were "initially undecided about car ownership" agreed that pro-EV initiatives would encourage them to own EVs. The report concluded that there was a substantial and inadvertent risk of swaying people towards car ownership through pro-EV initiatives and messaging.²⁴

Singapore's Vehicle Ownership Control Framework

The Vehicle Quota System (VQS) was implemented in 1990 to regulate the number of vehicles in Singapore. Its main lever was the Certificate of Entitlement (COE) licensing regime, which limited the number of allowed vehicles within categories demarcated by engine capacity/power.²⁵ In February 2018, the vehicle growth rate for all vehicles except goods vehicles and buses was finally brought down to zero after decades of slow, controlled growth. The zero-growth rate had been initially set to expire in January 2022, but was extended repeatedly until January 2028.^{26,27}

The VQS and other fees and taxes worked in concert to raise the cost of private transport:

- Upfront costs:
 - COE – The permit itself granted a license to own and operate a vehicle in Singapore for up to 10 years, and was allocated through open auctions. The annual quota was set at the projected number of vehicles deregistered the previous year plus new COEs based on a growth rate set by the LTA (zero since 2018 for cars and motorcycles).²⁸ In July 2026, the COE premiums for vehicles in Category A (smaller cars) and Category B (larger cars) reached \$129,000 and \$130,889 respectively,²⁹ reflecting the high demand for private vehicles.
 - Registration Fee – A flat fee of \$350.
 - Additional Registration Fee (ARF) – A progressive tax calculated as a percentage of the Open Market Value (OMV): 100% on the first \$20,000 of the OMV was charged at 100% and rose to 320% for an OMV above \$80,000.³⁰
 - Excise Duty – A tax set at 20% of OMV.
 - Goods and Services Tax (GST) – The consumption tax of 9% was payable on the selling price less relevant fees and charges.³¹

²⁴ Wen Wei Cheong et al., "Green Transport in Singapore".

²⁵ <https://www.nlb.gov.sg/main/article-detail?cmsuuiid=9fadc994-c8b2-45a9-9f35-372d05703ddc>

²⁶ "Zero growth rate for cars and motorcycles extended for 3 years until Jan 31, 2025", CNA, October 14, 2021, <https://www.channelnewsasia.com/singapore/zero-growth-rate-cars-and-motorcycles-extended-3-years-until-jan-31-2025-5632711> (<https://www.channelnewsasia.com/singapore/zero-growth-rate-cars-and-motorcycles-extended-3-years-until-jan-31-2025-5632711>)

²⁷ Singapore Ministry of Transport, "Vehicle ownership", accessed June 30, 2026, <https://www.mot.gov.sg/what-we-do/motoring-road-network-and-infrastructure/vehicle-ownership/>.

²⁸ Marsita Omar and Nor-Afidah Abd Rahman, "Certificate of Entitlement", Singapore Infopedia, June 2019, <https://www.nlb.gov.sg/main/article-detail?cmsuuiid=9fadc994-c8b2-45a9-9f35-372d05703ddc>.

²⁹ Motorist, "COE Results (July 2026 1st Bidding)", <https://www.motorist.sg/coe-results>.

³⁰ Parliament of Singapore, "Annual Budget Statement", Singapore Parliamentary Reports, Vol. 95, February 14, 2023.

³¹ "Vehicle Tax Structure", Land Transport Authority, accessed December 24, 2025, <https://onemotoring.lta.gov.sg/content/onemotoring/home/buying/upfront-vehicle-costs/tax-structure.html>.

- Ongoing ownership and usage charges
 - Electronic Road Pricing (ERP) – An electronic congestion-pricing tool introduced in 1998 to shift road demand to off-peak hours. Rates varied by time of day and are highest during peak periods.³² Transition to the new satellite-based ERP 2.0 was expected to be complete in 2026, which would enable distance-based road usage charges.³³
 - Road tax – This had to be renewed every 6 or 12 months,³⁴ and was priced higher for more expensive cars.³⁵ Cars registered to be used only during off-peak hours were subject to lower road taxes.³⁶
 - Fuel Excise Duty (FED) – paid at the pump per litre of fuel purchased.³⁷ Since EVs owners did not pay the FED, they were charged a six-monthly Additional Flat Component (AFC) of \$350 instead.³⁸

High upfront ownership costs were designed to discourage people from purchasing cars in the first place, while high usage costs mitigated the “sunk cost effect” that spurred car overuse after the initial purchase.³⁹

The effect of these cumulative ownership costs and usage charges made Singapore the most expensive country in the world to buy a car.⁴⁰ A 2022 comparison by *Business Insider* found that a Toyota Corolla Standard, a mass-market model on the lower end of the price spectrum in Singapore, cost over four times more in the United States.⁴¹

Effectiveness of Singapore's car ownership controls

As a result, the number of private cars in Singapore fell from 540,063 to 525,508 from 2013 to 2025, even as the country's population and economy both continued to grow (See Figure 1).

³² Kai Xiang Teo, “Made In Singapore: ERP, the Traffic Solution Pioneered by the Republic”, *The Straits Times*, March 21, 2025, <https://www.straitstimes.com/life/made-in-singapore-erp-and-the-polarising-traffic-solution-pioneered-by-the-republic>.

³³ Nian Tjoe Lee, “ERP 2.0: Govt at ‘Very Early Stage’ of Looking at Possible Distance-Charging Models, Says Chee”, *The Straits Times*, December 6, 2024, <https://www.straitstimes.com/singapore/transport/erp-2-0-govt-at-very-early-stage-of-looking-at-possible-distance-charging-models-says-chee>.

³⁴ “Vehicle Tax Structure”, Land Transport Authority.

³⁵ Parliament of Singapore, “Committee of Supply – Head L (Ministry of Sustainability and the Environment)”, Singapore Parliamentary Reports, Vol. 95, March 4, 2021.

³⁶ “Off-Peak Car Schemes (OPC, ROPC, WEC)”, Land Transport Authority, accessed December 24, 2025, <https://onemotoring.lta.gov.sg/content/onemotoring/home/buying/vehicle-types-and-registrations/car/off-peak-car-schemes.html>.

³⁷ Parliament of Singapore, “Annual Budget Statement”, Singapore Parliamentary Reports, Vol. 94, February 18, 2020.

³⁸ Parliament of Singapore, “Rationale for Annual Additional Flat Component in Electric Car Road Tax”, Singapore Parliamentary Reports, Vol. 95, May 10, 2021.

³⁹ Siqi Song, Chen-Chieh Feng, and Mi Diao, “Vehicle Quota Control, Transport Infrastructure Investment and Vehicle Travel: A Pseudo Panel Analysis”, *Urban Studies* 57, no. 12 (September 2020): 2527–46, <https://doi.org/10.1177/0042098019880777>.

⁴⁰ Mariko Oi, “Cost of Car Ownership Soars in Singapore”, *Business, BBC News*, October 5, 2023, <https://www.bbc.co.uk/news/business-67014420>.

⁴¹ Marielle Descalsota, “Cars in Singapore Cost on Average 5 Times More than They Do in the US. Here's a Breakdown of What 5 Popular Cars Would Set You Back in Each Country”, *Business Insider*, June 29, 2022, <https://www.businessinsider.com/singapore-car-price-expensive-us-tesla-toyota-audi-honda-mercedes-2022-6>.

Singapore's Private Car Population by Year

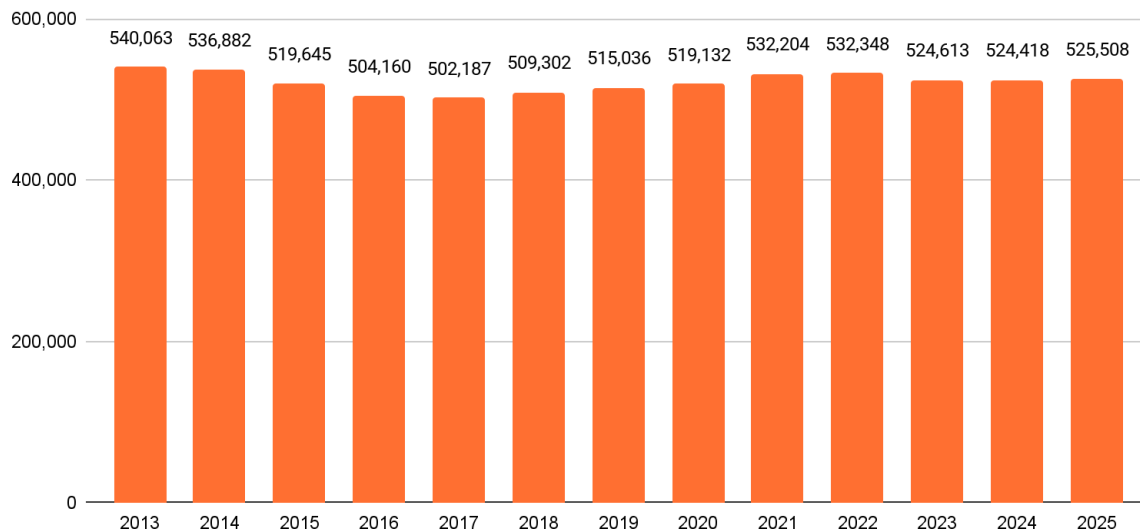


Figure 1: Singapore's Private Car Population by Year⁴²

EV transition and climate goals

Even as Singapore maintained strict controls on the population of private vehicles, policymakers anticipated that meeting the country's climate commitments would necessarily involve transitioning these cars from ICE to EVs.

In 2021, the *Singapore Green Plan* introduced "ambitious and concrete targets" to advance Singapore's sustainable development agenda.⁴³ It set a deadline of 2040 for phasing out ICE vehicles. It was also estimated that 4% of Singapore's total annual emissions could be abated if all light vehicles ran on electricity instead of fossil fuels.⁴⁴

In 2022, the Ministry of Transport announced a target to cut land transport emissions by 80% of the 2016 peak by or around mid-century, with the electrification of vehicles playing a key role.⁴⁵

Financial Incentives

Financial incentives targeted at EVs were rolled out incrementally from 2013, with the most significant incentives taking effect in the early 2020s. These incentives were deemed necessary for the EV transition because EVs were still much more expensive than ICE vehicles. In 2020, EVs were

⁴² Note: figures for all years are true as at the end of the year apart from 2025, which was true as at the end of November 2025. Land Transport Authority, "Motor Vehicle Population by Vehicle Type", accessed June 30, 2026, https://www.lta.gov.sg/content/dam/ltagov/who_we_are/statistics_and_publications/statistics/pdf/MVP01-1_MVP_by_type.pdf.

⁴³ "Singapore Green Plan 2030 Charts Ambitious Targets for Next 10 Years to Catalyse National Sustainability Movement", SG Green Plan, February 10, 2021, <https://www.greenplan.gov.sg/news/press-releases/2021-02-10-press-release-on-green-plan/>.

⁴⁴ Parliament of Singapore, "Committee of Supply – Head L (Ministry of Sustainability and the Environment)", Singapore Parliamentary Reports, Vol. 95, March 4, 2021.

⁴⁵ Parliament of Singapore, "Committee of Supply – Head L (Ministry of Sustainability and the Environment)", Singapore Parliamentary Reports, Vol. 95, March 8, 2022.

still about 78% more expensive than ICE vehicles,⁴⁶ and thus comprised only 0.18% of Singapore's car population.⁴⁷ During the Budget 2020 debates, then-Deputy Prime Minister Heng Swee Keat stated explicitly that EV-related financial incentives were intended only to "close the cost premium" between EVs and ICE vehicles – not to encourage car purchases.⁴⁸

These incentives worked on several fronts simultaneously and were adjusted as the cost gap between EVs and ICE vehicles narrowed. Beyond just EVs, these policy adjustments also incentivised the purchase of less pollutive petrol vehicles like hybrids:

- Vehicular Emissions Scheme (VES) – rebates were given on the ARF (or an additional surcharge was imposed) based on the reduction (or over-production) of pollutive emissions; this was valid for new cars, imports, and taxis.⁴⁹
 - First introduced in 2013 as the Carbon Emissions-based Vehicle Scheme (CEVS) covering only CO₂; it was revised in 2018 to the VES that included four more pollutants [hydrocarbons (HC), carbon monoxide (CO), nitrogen oxides (NOx) and particulate matter (PM)].
 - Tweaked several times in the early 2020s to widen the gap between clean and dirty vehicles, and to distinguish between pure ICE vehicles and cleaner versions like hybrids.
 - Most recently, VES rebates were reduced as the cost gap between EVs and ICE vehicles closed, even as the surcharge on pollutive vehicles continued to increase. The highest rebate would fall from the initial \$25,000 to \$22,500 in 2026 and further to \$20,000 in 2027, while the highest surcharge would be raised from \$25,000 to \$35,000 (2026) and then \$45,000 (2027). Petrol hybrids were excluded from rebates entirely.
 - Rebates for taxis were set at 50% above private car rates throughout, reflecting their higher driven mileage and the policy priority of electrifying commercial fleets.
- Electric Vehicle Early Adoption Incentive (EEAI) – a 45% rebate on ARF, introduced in January 2021, capped at \$20,000. Combined with VES, the maximum total rebate available to a new EV buyer in 2021 was \$45,000.
 - In 2022, the ARF floor of \$5,000 for EV purchases was eliminated to enable buyers of cheaper EVs to maximise their EEAI rebates.⁵⁰
 - As EV adoption grew, the cap for ARF rebates was progressively cut to \$15,000 in 2024, then to \$7,500 in 2026; and would be discontinued entirely in 2027.⁵¹

⁴⁶ Parliament of Singapore, "Committee of Supply – Head W (Ministry of Transport)", Singapore Parliamentary Reports, Vol. 94, March 5, 2020.

⁴⁷ Ahmad Zhaki Abdullah, "Incentives Likely to Encourage Electric Vehicle Adoption in Singapore, but Questions Remain, Say Analysts", CNA, February 19, 2020, <https://www.channelnewsasia.com/singapore/electric-vehicles-ev-budget2020-reaction-singapore-778581>.

⁴⁸ Parliament of Singapore, "Debate on Annual Budget Statement", Singapore Parliamentary Records, Vol. 94, February 28, 2020.

⁴⁹ "Vehicle Tax Structure", Land Transport Authority.

⁵⁰ Ting Wei Toh, "Cost of Owning Electric Vehicles to Be Lowered to Boost Early Adoption", *The Straits Times*, February 17, 2021, <https://www.straitstimes.com/singapore/cost-of-owning-electric-vehicles-to-be-lowered-to-boost-early-adoption>.

⁵¹ "Buying an EV? Rebates Will Shrink from 2026 - Here's How Much You'll Save", CNA, September 8, 2025, <https://www.channelnewsasia.com/singapore/faq-electric-vehicle-incentives-extended-rebates-benefits-cost-savings-reduced-ves-eeai-revision-5338081>.

- With the most recent revisions, the maximum combined VES and EEAI rebates would drop significantly to \$20,000 in 2027 from the peak of \$45,000 in 2021.⁵²
- COE category revision – In May 2022, the Maximum Power Output (MPO) threshold for Category A COEs was raised from 97kW to 110kW, but only for fully electric vehicles. The MPO for non-fully electric cars remained at 97kW. Prior to this change, most EVs had required more expensive Category B COEs because of powerful electric motors.⁵³
- Road tax revision – Early EVs had powerful electric motors and attracted significantly higher road tax premiums than ICE vehicles. A “comparatively humble” EV therefore had the same tax bill as a 3,000cc ICE vehicle in 2020.⁵⁴ The road tax schedule was revised in 2021 to reduce it for some EV models by as much as 40%.⁵⁵ Additional changes were implemented in 2022 to differentiate between mass- and mid-market EVs and their ICE-powered counterparts.⁵⁶

Infrastructure and Regulatory Enablers

Policymakers in Singapore knew that financial incentives alone would not be enough to drive the EV transition. The country would also need to enhance its physical and regulatory ecosystem. As recently as 2024, a survey by Rakuten Insight found that 35% of respondents cited lack of charging infrastructure as an obstacle to purchasing an EV, with half saying that having chargers near homes or workplaces was important.⁵⁷ Beyond deployment of charging points, Singapore also had to upgrade its electricity grid to handle the increased electrical load, and establish a robust regulatory framework for charging safety and building standards:

- EV charging points – in 2021, Singapore set a target of 60,000 charging points by 2030, with 40,000 in public carparks and 20,000 within private premises.⁵⁸ At the time, there were only 1,900 charging points in the whole country.⁵⁹

⁵² “Supporting Cleaner and Greener Vehicles for A Sustainable Land Transport Sector”, Land Transport Authority, February 18, 2020, https://www.lta.gov.sg/content/ltagov/en/newsroom/2020/2/news-releases/Supporting_cleaner_and_greener_vehicles.html.

⁵³ Nian Tjoe Lee, “New COE Criterion to Increase Number of Mass-Market EVs”, *The Straits Times* (Singapore), March 9, 2022, <https://www.straitstimes.com/singapore/politics/new-coe-criterion-to-increase-number-of-mass-market-evs>.

⁵⁴ Daryl Lee, “Electric Cars in Singapore: Does It Make Sense?”, *Robb Report Singapore*, January 8, 2020, <https://robbreport.com.sg/electric-cars-in-singapore-does-it-make-sense/>.

⁵⁵ Parliament of Singapore, “Committee of Supply – Head L (Ministry of Sustainability and the Environment)”.

⁵⁶ Christopher Tan, “Budget Debate: Road Tax for Mass-Market Electric Cars in S’pore to Be Lowered from next Year”, *The Straits Times*, March 4, 2021, <https://www.straitstimes.com/singapore/transport/road-tax-for-mass-market-electric-cars-to-be-lowered-from-next-year>.

⁵⁷ “New: Snapshot – Electric Cars”, *Rakuten Insight*, April 30, 2024, <https://insight.rakuten.com/new-snapshot-electric-cars/>.

⁵⁸ “Factsheet: Accelerating Nationwide Deployment of Electric Vehicle Charging Points”, Land Transport Authority, March 4, 2021, https://www.lta.gov.sg/content/ltagov/en/newsroom/2021/3/news-release/Accelerating_nationwide_deployment_of_electric_vehicle_charging_points.html.

⁵⁹ Cheryl Heng, “Singapore’s Electric Car Charging Providers Put Expansion Plans in Place”, *Business, South China Morning Post*, February 17, 2021, <https://www.scmp.com/business/companies/article/3122026/singapores-electric-car-charging-providers-put-expansion-plans>.

- Every Housing Development Board (HDB) carpark was to have at least three EV chargers by 2025;⁶⁰ approximately 85% met this requirement by October of that year, with the remainder delayed by technical constraints or community preferences.⁶¹
- Installation grants included the EV Common Charger Grant (ECCG) for non-landed private residences,⁶² and the Electric Heavy Vehicle Charger Grant (EHVG) for heavy vehicle operators.⁶³
- Grid upgrades – Singapore's electricity grid required expansion and upgrading to meet the projected demand of 60,000 EV chargers.⁶⁴ The Singapore Integrated Transport Energy Model (SITEM), commissioned by the Prime Minister's Office, modelled EV charging patterns and identified necessary infrastructure upgrades;⁶⁵ and LTA and the Energy Market Authority (EMA) said in 2025 that grid augmentation would be an ongoing 20-year programme.⁶⁶
- Regulatory framework – For new and existing buildings undergoing major works, the Electric Vehicles Charging Act (EVCA) in 2022 established a safety and standards regime governing charger approval, installation, certification, and access classification, specifying minimum electrical capacity and charging station numbers within parking areas.⁶⁷

Core Policy Tensions and Trade-offs

These policy changes significantly boosted consumer demand for EVs and rapidly shaped consumer behaviour. Unfortunately, they also increased the *perceived affordability* of EVs, which went against the policy intention behind decades of ownership control. Revisions to COE categories worsened this tension – EVs originally designed and manufactured as more powerful, premium vehicles could trivially have their motor output tuned downwards to qualify for Category A COEs without materially

⁶⁰ Parliament of Singapore, "Projected Average Ratio of Electric Vehicle (EV) Charging Points", Singapore Parliamentary Reports, Vol. 95, April 4, 2022.

⁶¹ Esther Loi, "EV Chargers Available at over 1,600 HDB Carports", *The Straits Times*, October 26, 2025, <https://www.straitstimes.com/singapore/transport/85-of-hdb-carparks-have-ev-chargers-will-miss-target-of-100-completion-by-end-2025>.

⁶² Yong Jun Yuan, "LTA to Co-Fund 2,000 EV Charger Installations in Condos, Private Apartments", *The Business Times*, July 19, 2021, <https://www.businesstimes.com.sg/companies-markets/transport-logistics/lt-a-to-co-fund-2000-ev-charger-installations-in-condos-private-apartments>.

⁶³ Derryn Wong, "Singapore Introduces S\$40,000 Incentive for Electric Heavy Commercial Vehicles, Co-Funds up to S\$30,000 for Chargers", *The Business Times*, March 5, 2025, <https://www.businesstimes.com.sg/singapore/singapore-offers-s40000-incentive-electric-heavy-vehicles-co-funds-s30000-chargers>.

⁶⁴ Cheryl Tan, "S'pore Plans to Upgrade Electricity Grid amid Rising Energy Demand, Increasing Use of Renewables", *The Straits Times*, February 12, 2023, <https://www.straitstimes.com/singapore/s-pore-plans-to-upgrade-electricity-grid-amid-rising-energy-demand-increasing-use-of-renewables>.

⁶⁵ "Leveraging Digital Solutions to Future-Proof Singapore's Energy Grid", Energy Market Authority, October 24, 2023, <https://ema.gov.sg/news-events/news/media-releases/2023/leveraging-digital-solutions-to-future-proof-singapore-energy-grid>.

⁶⁶ Justin Ong Guang Xi, "IN FOCUS: No New Petrol-Only Cars in Singapore from 2030 – What Infrastructure Needs to Change?", CNA, October 1, 2025, <https://www.channelnewsasia.com/singapore/electric-vehicles-singapore-infrastructure-charging-petrol-stations-workshops-5376971>.

⁶⁷ "Regulating the Safety of EV Chargers", Land Transport Authority, accessed December 25, 2025, https://www.lta.gov.sg/content/ltgov/en/industry_innovations/technologies/electric_vehicles/regulating_safety_of_ev_chargers.html.

affecting performance, and manufacturers took advantage of this fact; BYD, Hyundai and ORA all introduced Singapore-specific models that stayed under Category A's revised 110kW ceiling.⁶⁸

These market and consumer behaviour responses distorted how Category A and Category B COEs were supposed to work, with Category A prices exceeding Category B three times within four months in 2026, defeating the COE framework's aim to force buyers of larger, more powerful vehicles to pay more. This Category A-B gap peaked in April 2026, when the price for a Category A COE at auction cost \$2,009 more than a Category B COE.⁶⁹ A system designed to discourage the ownership of larger, more premium cars became distorted by policy-induced EV demand and now misfired with some frequency.⁷⁰

Electrifying Cars Without Encouraging More (ICE) Cars?

By mid-2026, EVs had surged to 60.6% of new car registrations⁷¹ (up sharply from just 18.2% in 2023⁷²), but Singapore's overall car population was electrifying much more slowly. In Singapore, cars typically stayed on the road for at least a decade (the typical validity period of a COE), so even a significant increase in new EVs purchased would take years to improve the composition of the overall vehicle fleet. In most of the years immediately following the above policy adjustments, sales of hybrid cars (petrol-electric and petrol-electric plug-in) actually outstripped EV sales, growing the share of hybrids as a proportion of the total car population from 8.6% to 18.4%, which meant that these policy changes had, in the short run, boosted demand for hybrids even more than EVs.^{73,74}

The cause of this was partly definitional. *Singapore Green Plan 2030* had committed to all new car registrations being "cleaner-energy models" by 2030, without pinning down what that encompassed exactly. LTA's own vehicle statistics classified mild-hybrids – in which electric motors only assisted the engine and therefore remained reliant on petrol – under the same "petrol-electric" category as genuine hybrids.⁷⁵ By that criterion, Singapore could meet its 2030 commitment by eliminating pure diesel and petrol ICE vehicles, regardless of the number of petrol-reliant vehicles still being purchased. This target came in well below the standard adopted elsewhere: the International Energy

⁶⁸ Lee Nian Tjoe, "Several carmakers shipping EVs here that are almost uniquely Singapore", *The Straits Times*, July 16, 2023, <https://www.straitstimes.com/singapore/transport/several-carmakers-shipping-evs-here-that-are-almost-uniquely-singapore>

⁶⁹ "Why has Cat A COE price exceeded Cat B's thrice in four months?", *The Straits Times*, June 18, 2026, <https://www.straitstimes.com/singapore/transport/why-has-the-cat-a-coe-price-exceeded-cat-bs-thrice-in-four-months>

⁷⁰ Derryn Wong, "More EVs in Category A Could Crowd out Hybrids, Drive up COE Prices", *The Business Times*, June 26, 2024, <https://www.businesstimes.com.sg/companies-markets/transport-logistics/more-evs-category-could-crowd-out-hybrids-drive-coe-prices>.

⁷¹ "As EVs move up a gear in S'pore, what happens after the sale?", *The Straits Times*, July 2026, <https://www.straitstimes.com/multimedia/graphics/2026/07/electric-vehicle-ownership/index.html>

⁷² Nian Tjoe Lee, "Nearly Half of Cat A COEs Go to EVs, Which Account for 43% of New Sales so Far in 2025", *The Straits Times* (Singapore), November 2, 2025, <https://www.straitstimes.com/singapore/transport/nearly-half-of-cat-a-coes-go-to-evs-which-account-for-43-of-new-sales-so-far-in-2025>.

⁷³ Land Transport Authority, Motor Vehicle Population by Type of Fuel Used, report M09, table "Cars" (Singapore: LTA, 2022), https://www.lta.gov.sg/content/dam/ltagov/who_we_are/statistics_and_publications/statistics/pdf/M09-Vehs_by_Fuel_Type.pdf

⁷⁴ Land Transport Authority, Motor Vehicle Population by Type of Fuel Used, report M09, table "Cars" (Singapore: LTA, 2026), https://www.lta.gov.sg/content/dam/ltagov/who_we_are/statistics_and_publications/statistics/pdf/M09-Vehs_by_Fuel_Type.pdf

⁷⁵ Clifford Chan, "Is Singapore's Green Plan 2030 Not Quite What It Seems?", *SGCarMart*, December 7, 2022, <https://www.sgcarmart.com/articles/features/is-singapores-green-plan-2030-not-quite-what-it-seems-1945>

Agency's Net Zero Scenario called for all car sales by 2035 to be zero-emissions, a category that excluded mild-hybrids.⁷⁶

Nevertheless, even a complete shift to EVs from ICE vehicles would not be the ideal solution, given Singapore's dependence on natural gas for electricity generation. Some transport experts also warned that incentivising privately owned EVs was unwise, and that public transport remained the best option in terms of emissions and traffic congestion.⁷⁷

The improved cost effectiveness of new EVs also caused some consumers to treat EVs "like consumer electronics", opting for new EVs over used ones and upgrading soon after the launch of new models in the constant pursuit of improved features.⁷⁸ Moreover, concerns about battery degradation depressed demand for used EVs on the secondary market. As the bulk of an EV's carbon emissions were produced during its manufacture, EVs were a greener choice only from a lifecycle perspective and if they remained on the road for a long time.⁷⁹ In other words, simply replacing ICE vehicles with newly manufactured EVs would decarbonise Singapore's land transport sector much less than expected at the systems level, especially given that the COE system caused many EVs to be replaced after just 10 years.

Population Control vs Technology Transition

The government's EV policies were intended to promote adoption, but the COE system had been built around managing the total vehicle population. Incentives that reduced the upfront costs of EVs were therefore misaligned with the fundamental intent of the COE framework that used high upfront costs to manage demand. As a result, the rollout of broad EV incentives in the 2020s was accompanied by steadily rising COE premiums.

Nevertheless, Singapore managed to drive EV adoption faster than almost anywhere else. And despite some cutback of EV incentives in early 2026, industry experts and EV sellers expected the EV adoption rate to continue to rise.⁸⁰ Sales were increasingly driven by the availability of cost-effective models from China and the continued expansion of charging infrastructure, and ever higher surcharges on petrol-driven cars.⁸¹

Improved EV affordability did not just encourage the substitution of ICE vehicles with EVs. It also seemed to induce latent demand over and above the baseline demand for private vehicles. The price for Category A COEs continued to increase throughout the 2020s to hit a record \$129,000 in early

⁷⁶ Therese Soh, "Singapore Car Buyers Prefer Hybrid EVs to Fully Electric: Deloitte Study", *The Business Times*, September 23, 2025, <https://www.businesstimes.com.sg/companies-markets/transport-logistics/singapore-car-buyers-prefer-hybrid-evs-fully-electric-deloitte-study>.

⁷⁷ Taufiq Zalizan, "The Big Read: More Drivers Jumping on the EV Bandwagon, but Charger Infrastructure and Costs Loom", *CNA*, July 14, 2024, <https://www.channelnewsasia.com/today/big-read/electric-vehicles-ev-charger-infrastructure-costs-big-read-4477561>.

⁷⁸ Charlotte Lim, "Dealers Say Second-Hand EVs Harder to Resell, Depreciation Steeper than Petrol Cars", *CNA*, December 26, 2025, <https://www.channelnewsasia.com/singapore/electric-vehicles-evs-resale-dealers-depreciation-5691571>.

⁷⁹ Zhenhai Gao et al., "Electric Vehicle Lifecycle Carbon Emission Reduction: A Review", *Carbon Neutralization* 2, no. 5 (2023): 528–50, <https://doi.org/10.1002/cnl2.81>.

⁸⁰ Nian Tjoe Lee, "Why Singapore Has Opted for Fewer Carrots, More Sticks to Get Car Buyers to Go Green", *The Straits Times*, September 12, 2025, <https://www.straitstimes.com/singapore/transport/why-spore-has-opted-for-fewer-carrots-more-sticks-to-get-car-buyers-to-go-green>.

⁸¹ Derryn Wong, "Rebate Cuts Won't Hurt Singapore's Momentum".

July 2026.⁸² This happened despite there being significantly more Category A COEs available than in January 2013 when prices last hit a record high of \$91,010 (see Figure 2).

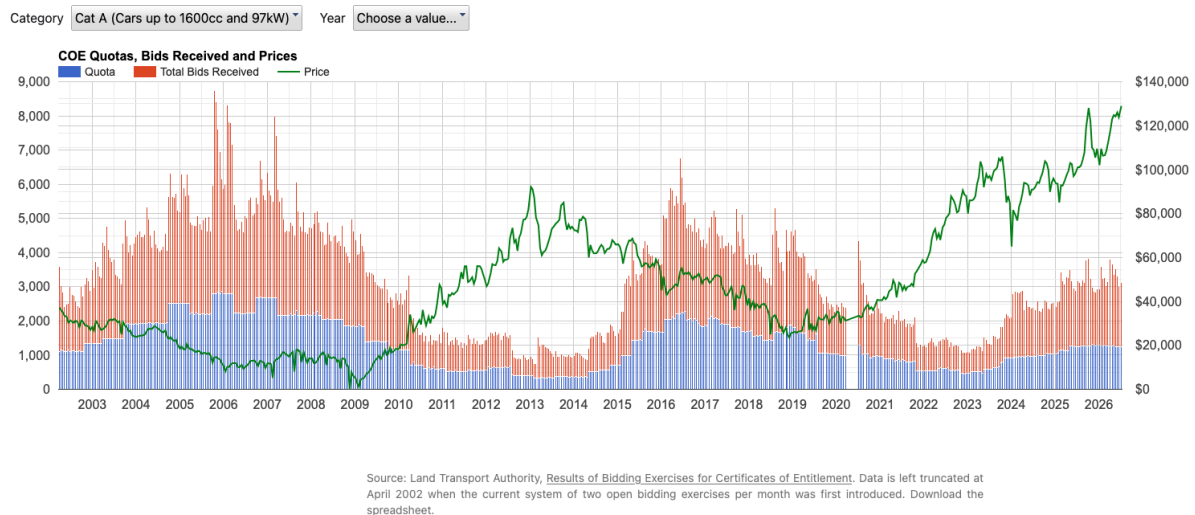


Figure 2: Category A COE availability and prices since 2002.⁸³

When the flood of down-tuned (but nonetheless desirable) premium EV models into Category A caused prices there to exceed those of Category B three times in four months,⁸⁴ the LTA responded by launching a formal review of the COE categorisation system in March 2026; with Acting Minister for Transport Jeffrey Siow acknowledging in parliament that the categories had drifted from their original purpose.⁸⁵

These contradictions happened when the COE system designed to limit vehicle ownership collided with an electrification policy that sought to quickly grow the number of EVs on the road. The COE system was designed to allocate a scarce national resource – the right to own a vehicle – based on demand and supply, with high prices acting as the rationing mechanism.⁸⁶ EV incentives, by reducing the effective cost of entry for a new class of buyers, undermined that rationing function by expanding the pool of willing bidders. Putting aside the necessity of transport electrification, the government was in effect using tax policy to cap the number of cars and encourage people to buy them *at the same time*. As COE prices continued to break records, the government recognised that certain groups like families with young children, seniors and people with disabilities could have genuine need for private transport options, with then-Minister for Transport S Iswaran stating in 2023 that Singapore's car policy involved making cars "available as widely as possible" within Singapore's zero-growth constraint.⁸⁷

⁸² Motorist, "COE Results (July 2026 1st Bidding)".

⁸³ SGCharts, "COE Quotas Since 2002", <https://coe.sgcharts.com/>

⁸⁴ "Why has Cat A COE price exceeded Cat B's thrice in four months?", The Straits Times.

⁸⁵ "Singapore to Review COE Categorisation System amid Price Convergence Concerns", *The Online Citizen*, March 4, 2026, <https://theonlinecitizen.com/2026/03/04/singapore-to-review-coe-categorisation-system-amid-price-convergence-concerns/>

⁸⁶ Elaine Koh, "COE Allocates Scarce Resource Based on Demand and Supply: MOT", *The Business Times*, August 20, 2025, <https://www.businesstimes.com.sg/opinion-features/coe-allocates-scarce-resource-based-demand-and-supply-mot>

⁸⁷ Parliament of Singapore, "Meeting the Transport Needs of Singaporeans", Singapore Parliamentary Records, vol. 95, May 8, 2023.

Amid rapidly rising COE prices, the government made several supply-side interventions from 2023 to reduce the volatility of COE supply (and therefore prices). An additional 30,813 COEs were injected into the system between May 2022 and November 2025.⁸⁸ Then again in October 2024, the LTA announced that up to 20,000 additional COEs would be made available, citing lower congestion in the Central Business District.⁸⁹ These interventions occurred in spite of the zero-growth policy for the vehicle population having been in place since 2018. As a result, Singapore's motor vehicle population crossed 1,000,000 for the first time in 2024.⁹⁰

Equity and Access

The broad push for rapid EV adoption raised concerns about equity and access. The high cost of vehicle ownership in Singapore meant that high-income households – i.e. those most likely to buy cars in the first place – were the main beneficiaries of EV incentives, making these subsidies a regressive, taxpayer-funded benefit.⁹¹

The rapid development of the EV industry, especially in China, provided a supply-side boost to EV availability in Singapore, which created “distortions” in the COE market.⁹² Dealers of affordable Chinese EVs engaged in aggressive price wars and sold attractively priced COE and EV bundles to gain market share, pushing up COE premiums. EV incentives also spurred demand, particularly for mass-market models in Category A. The combination of financial incentives and dealership promotions made some EVs cheaper than comparable ICE vehicles and hybrids; a new BYD Atto 3 EV cost \$157,888 in April 2025, \$23,000 less than the comparable hybrid Toyota Yaris Cross.⁹³ Chinese EVs became so compelling that by 2024, BYD unseated Toyota as the best-selling brand in Singapore, a position the latter company held for many years.⁹⁴

One EV distributor observed that EV incentives were “particularly significant” to budget-conscious car buyers. Yet, the incentives themselves were self-defeating within the context of the auction-based COE pricing mechanism: the surge in mass-market demand drove Category A COE premiums to successive records, promptly pricing these budget-conscious buyers back out of the market.

Overly high COE premiums also had a knock-on effect on the private-hire vehicle (PHV, Singapore's term for the Uber-like transport services that function like taxis) industry, which was an important part of the country's car-lite solution. Because PHV operators and drivers bid for COEs in the same pool as private car buyers, record COE premiums made the cost of such transport services even less

⁸⁸ Parliament of Singapore, “Data on “Cut and Fill” Approach to Reassign COE Quotas and Further Medium-term Plans to Equalise Supply,” Singapore Parliamentary Records, vol. 96, November 4, 2025.

⁸⁹ Yufeng Kok, “LTA to Add up to 20,000 COEs across Vehicle Categories over next Few Years from Feb 2025”, *The Straits Times*, October 29, 2024, <https://www.straitstimes.com/singapore/transport/lta-to-add-up-to-20000-coes-across-vehicle-categories-over-next-few-years-from-feb-2025>.

⁹⁰ “Annual Vehicle Statistics 2024”, Land Transport Authority.

⁹¹ Tilak K. Doshi and Nahim B. Zahur, “Assessing Singapore's Electric Vehicle Policies”, *IAEE Energy Forum*, no. 106 (Fourth Quarter 2020), <https://www.iaee.org/newsletter/issue/106>.

⁹² Victor Kwan, “COE Prices Are Being Supercharged by Surge in Chinese EVs”, *The Straits Times*, November 3, 2025, <https://www.straitstimes.com/opinion/surge-in-chinese-evs-is-supercharging-coe-prices>.

⁹³ Nian Tjoe Lee, “EVs Account for over 40% of New Car Sales in Singapore in Q1 2025”, *The Straits Times*, April 22, 2025, <https://www.straitstimes.com/singapore/transport/evs-account-for-over-40-of-new-car-sales-in-singapore-in-q1-2025?ref=inline-article>.

⁹⁴ “BYD overtakes Toyota to become Singapore's No. 1 seller”, *The Business Times*, January 22, 2025, <https://www.businesstimes.com.sg/international/global/byd-overtakes-toyota-become-singapores-no-1-seller>

affordable.⁹⁵ Transport economist Walter Theseira noted that Singaporeans needed “viable alternatives” to car ownership and that a shortage of taxis and PHVs would push Singaporeans towards car ownership, expensive as that option was.⁹⁶

Conclusion

As transport electrification became a national priority, Singapore’s vehicle ownership framework became shaped by two competing policy logics. Since the 1960s, the government had discouraged privately owned vehicles through high upfront and ongoing usage costs, favouring public transport as the primary mode for daily commutes. Encouraging car buyers to switch away from ICE vehicles seemed like sensible climate policy that turned out to be difficult to reconcile with this framework in practice.

This tension played out within the COE system. Because COE’s auction-based allocation mechanism used (high) prices to allocate the highly sought-after right to own a private vehicle, any policy moves that made EVs cheaper to purchase widened the pool of potential buyers, and therefore the number of bidders competing for a limited pool of COEs that had not grown since 1998. Electrifying private transport was a genuine climate win, but it sharpened issues with equity and access inherent to Singapore’s private transport framework.

This suggested that decarbonising land transport in a land-scarce city state could not rest on electrification alone. It needed to be paired with genuine policy shifts that tackled the root causes of the (enormously expensive) desire for private transport. There are signs that this shift was already underway after decades of investment in public transport: A 2022 survey found that fewer than 20% of Singaporean youth saw car ownership as important to their lives,⁹⁷ and half of those Singaporeans surveyed in a 2025 industry study said they would give up car ownership altogether if a fully realised mobility-as-a-service (MaaS) option existed.⁹⁸

This continued attitudinal shift would depend on the government holding up its end of the bargain by enhancing the affordability, access and reliability of public transport so that not owning a car felt like a viable (or even preferred) choice regardless of life stage or income level.

Singapore’s experience with EVs showed that, beyond just swapping out petrol engines for electric motors, decarbonising urban transport required a comprehensive rethink of how electrification, public transport and shared mobility needed to work in unison.

⁹⁵ Clement Ooi, “A Look at S’pore’s COE Policy and How It Affects Ride-Hailing Sector, Firms with Vehicle Fleets”, *Vulcan Post*, August 3, 2022, <https://vulcanpost.com/798405/how-coe-affects-ride-hailing-firms-with-vehicle-fleets/>.

⁹⁶ Raphael Lim, “Ride-Hailing, COE Prices and Singapore’s Car-Lite Goal”, *The Business Times*, June 2, 2023, <https://www.businesstimes.com.sg/opinion-features/ride-hailing-coe-prices-and-singapores-car-lite-goal>.

⁹⁷ Christopher Tan et al., “5 Takeaways: Youth Opinions on Car Ownership in Singapore”, *The Straits Times*, June 18, 2022, <https://www.straitstimes.com/multimedia/graphics/2022/06/singapore-youth-car-survey-2022/index.html?state=eyJyZWVkaWEvZ3JhcGhpY3MvMjAyMi8wNi9zaW5nYXBvcmlUeW91dGgtY2FyLXN1cnZleS0yMDIyL2luZGV4Lmh0bWwifQ%3D%3D>.

⁹⁸ 2025 *Global Automotive Consumer Study* (Deloitte, 2025), <https://www.deloitte.com/content/dam/assets-zone1/southeast-asia/en/docs/industries/consumer/2025/sea-cb-2025-sea-automotive-consumer-study.pdf>.