TRANSPORT AUSTRALIA

Road to Reform

Why Australia needs a sustainable funding model

MAY 2026

ACKNOWLEDGMENT OF COUNTRY

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We are committed to advancing reconciliation with Aboriginal and Torres Strait Islander peoples. We recognise the importance of respectful relationships, cultural understanding, and meaningful engagement in shaping a more inclusive transport sector.

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EXECUTIVE SUMMARY

Australia is ready for road funding reform that is fair and delivers a high performing road network which services the growing needs of our economy.

The revenue gap of road funding is accelerating. Australia is in need of a solution to falling fuel excise revenue.

The current geopolitical disruption in the Middle East and the blockade of the Strait of Hormuz has seen Electric Vehicle (EV) sales jump, and for the first time ever combined EV/Hybrid sales have topped above 20 per cent of all sales[1]. While this is not yet a sustained trend the New Vehicle Efficiency Standard is simultaneously shrinking excise from the petrol fleet as well.

Our reliance on fuel excise revenues to keep our road infrastructure strong is increasingly of concern. Every month without a new funding model the shortfall widens.

A nationally consistent road user charging (RUC) system would fill this funding gap.

The public is ready.

Transport Australia's RUC national poll found 59 per cent of Australians support replacing fuel excise with RUC — rising to 71 per cent among EV and hybrid drivers.

With 78 per cent of Australians concerned about inadequate road maintenance, support for reform increases when funding is dedicated to road investment.

The technology is available.

Proven technology solutions are available today for all vehicle types that can calculate a RUC.

- *Native connected vehicles* - most modern EVs already have built-in connectivity to automatically collect vehicle data required for RUC calculation.
- *On-Board Units (OBUs)* - often mounted on windscreens retrofit to any vehicle without embedded technology and compute locally for privacy to inform RUCs.
- *Telematics* - devices that are well-established in Australian commercial fleets supports data collection and billing for road user charging.
- *Smartphone apps* - suitable as data portals, manual odometer interface or direct data capture tools, frequently deployed alongside other solutions rather than as a standalone system for road usage calculation.

While an initial RUC could be implemented quickly using one of the above technologies, a future fully developed system would not need to pick winners. Instead, Australia can adopt a multi-technology approach providing users choice, fostering competition and future-proofing the system. The market will determine what works best for different vehicle types and user needs.

[1]Federal Chamber of Automotive Industries (2026). *EVs surge as buyers respond to fuel uncertainty*

***The international evidence is clear*.**

There are many lessons from around the world that Australia can adopt to develop a RUC system that is fit-for-purpose.

A RUC system must be nationally consistent. Fragmented state-by-state approaches, as seen in the United States, create interoperability issues and administrative duplication.

Allowing multiple technology solutions builds trust and improves customer experience.

Building on what already exists, whether that is tolling infrastructure, telematics governance, heavy vehicle reporting and modern vehicle connectivity, are assets to leverage, not reinvent.

Around the globe, RUC's implementation does not show to impact EV uptake, however the removal of EV subsidies is linked to a reduction in EV registrations.

The question is no longer whether Australia needs RUC, it is how to implement it in a way that is fair and transparent.

Transport Australia urges the Federal Government to embrace this opportunity to implement a nationally harmonised RUC framework this term of government.

This paper sets out key technology solutions and international evidence to inform the design of an equitable pathway forward.

The fiscal imperative is urgent.
The public is supportive.
The technology is proven.

What we need is a national plan for reform.

SUMMARY OF RECOMMENDATIONS

Based on the experience of implementing RUC across the world, Transport Australia recommends the below actions to help inform Australia's RUC journey:

1. Implement a nationally harmonised RUC that ensures interoperability across different states and territories to enable consistency in customer experience.

2. Enable a variety of technology solutions to leverage different capabilities and provide greater customer choice – and by extension customer comfort with a RUC system.

3. Demonstrate tangible benefits of RUC revenue, such as improvements in road infrastructure, to help secure social licence.

4. Build on existing platforms and foundations that customers are familiar with in order to encourage acceptance.

5. Prioritise data security as central to the successful implementation of RUC, with solutions designed around the provision of privacy.

6. Consider equity options in system design that can reflect inherent differences in use cases, locations, abilities, and access to alternative transportation options.

7. Establish flexible data aggregation solutions to allow for a variety of technology solutions and provide a seamless customer experience.

The case for road user charging

WHY AUSTRALIA NEEDS ROAD USER CHARGING

Australia is at a crucial moment that requires road funding reform. With the New Vehicle Efficiency Standard (NVES) increasing the fuel economies of traditional petrol vehicles and an increasing uptake of battery electric vehicles (BEVs) and Plug-in Hybrid Electric Vehicles (PHEVs) - reaching close to 15 per cent of total vehicle sales as of the end of 2025[2] - traditional fuel excise revenue is in continual decline.[3]

In the current geopolitical climate resulting from the blockade of the Strait of Hormuz, BEV sales alone soared to 14.6 per cent in March 2026,[4] increasing further to 22.4 per cent of all sales once PHEVs are considered. While we are yet to confirm if this becomes the new standards the rise in EV uptake is welcome but does indicate continued trends of falling excise revenue.

This creates a challenge in ensuring the sustainability of road maintenance and transport infrastructure investment. Without a new funding model, Australia risks having unsafe roads and inequitable cost distribution among road users. Left unresolved this could impact the transport network's essential role of efficiently moving goods and services around the country and productivity of the Australian economy.

A RUC for all road users and vehicle types would create a fairer and more sustainable funding model for road maintenance and upgrades, to support our growing population.

What is road user charging?

A RUC is a fee paid by drivers for their use of the public road network, often on a per-kilometre basis. It is similar to other road funding schemes, such as fuel excise paid on each litre of fuel in Australia, and the revenue raised is used to, in part, fund the upkeep of roads.

To calculate a RUC, some vehicle data may need to be collected including vehicle type and weight.

There are many ways that a RUC can be administered:

- Electronically via an in-vehicle device or system
- Manually via odometer reading
- Pre-paid permit system
- Fixed fee paid as part of the vehicle registration process

Benefits of road user charging

Enables effective funding	RUC is an effective funding solution to address the shortfall in revenue collected via the fuel excise.
Ensures fairness in funding	RUC directly ties funding to the amount of wear and tear on our roads by each kilometre driven. It could ensure all vehicles, including EVs, contribute to road maintenance and upgrades.
Provides greater transparency in funding	RUC allows drivers to make more informed decisions about the costs inherent to driving and could encourage behavioural change to facilitate greater uptake of other modes of transport where available.

[2] Australian Automobile Association (2025). *Electric vehicle sales break records.*
[3] Parliamentary Budget Office (2022). *Fuel taxation in Australia*
[4] Federal Chamber of Automotive Industries (2026). *EVs surge as buyers respond to fuel uncertainty*

Policy position

Transport Australia supports the development of a national RUC for all road users and vehicle types.

This should be led by the Federal Government in close cooperation with all states and territories and prioritised this term of government 2025-28.

A nationally consistent RUC framework would ensure equity, efficiency, and long-term funding sustainability for Australia's vast road network.

A road user charge could be implemented in two ways:

1) removal of the fuel excise and replacement with a national RUC for all road users and vehicle types, or
2) applying RUC to all vehicles that do not pay the fuel excise and operating RUC in tandem with the current fuel excise system. Over time with the continued uptake of EVs, there would be a natural transition from fuel excise to RUC for all vehicles.

Community sentiment on road funding reform

The majority of Australians are in favour of reform to fix the deficit in revenue to pay for our vast road network. A recent national public opinion poll,[5] commissioned by Transport Australia, to understand public sentiment on a future potential road user charge found that 59 per cent of Australians support replacing the current fuel excise with a RUC for all drivers. This support increased to 71 per cent for EV/Hybrid drivers.[6]

The poll also uncovered that 78 per cent of Australians are concerned about a lack of road maintenance, with 63 per cent noting they are also concerned with ensuring fairness in road funding.[7] Notably, current EV/Hybrid drivers report higher rates of concern than the general public, with 84 cent per expressing concerns with maintenance and 68 per cent concerned with the fairness of the current system.[8]

Additionally, drivers of all types indicate increased support for a RUC if it is directly tied to improved road maintenance, which indicates dedicating RUC revenue to road funding helps to secure social licence for this reform.

78%	63%	59%	65%	71%
are concerned with a lack of road maintenance	are concerned with the fairness of road funding	support the implementation of a RUC	support a RUC that improves road maintenance	of EV/Hybrid drivers support a RUC

[5] Transport Australia (2026). *Road User Charging: National public poll*
[6] Ibid.
[7] Ibid.
[8] Ibid.

Implementing road user charging

TECHNOLOGY SOLUTIONS

Of all the ways to collect and administer road user charging, an electronic system via in-vehicle technologies is the most effective solution that offers both flexibility in implementation and the least ongoing administrative burden on users.

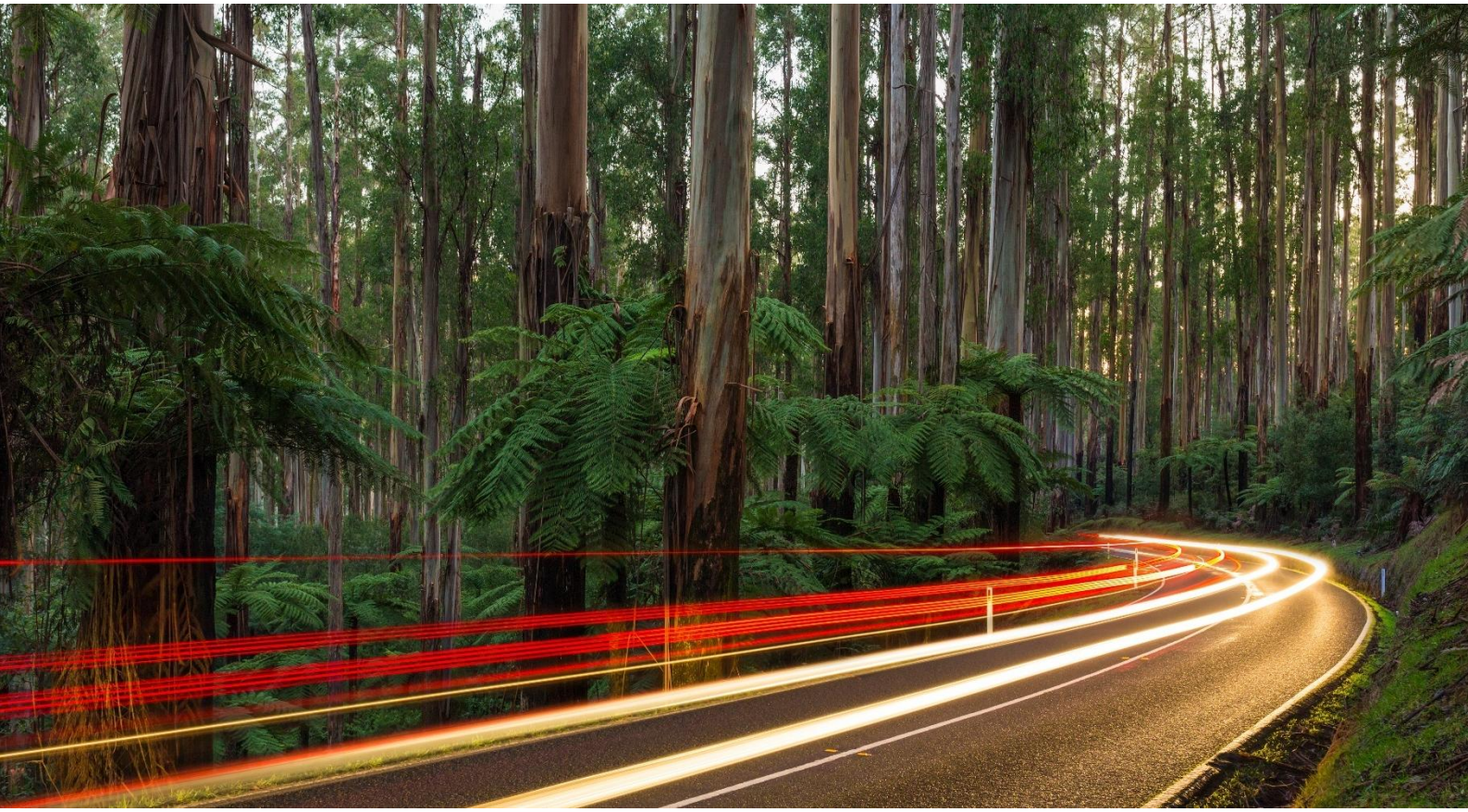
There are many viable technology solutions to achieve accurate and reliable charging for the use of roads. A combination of different technologies or multiple technologies deployed in parallel could provide customers with greater choice, foster competition and innovation, and allow users to leverage existing investments. Instead of picking winners, the market would decide what works best for each road user and vehicle type.

Technology solutions are available for RUC data collection in vehicles via native connected vehicles, On-Board Units (OBUs), telematics and smartphone apps. An overview of the capabilities, limitations, and benefits of each are outlined in the following sections.

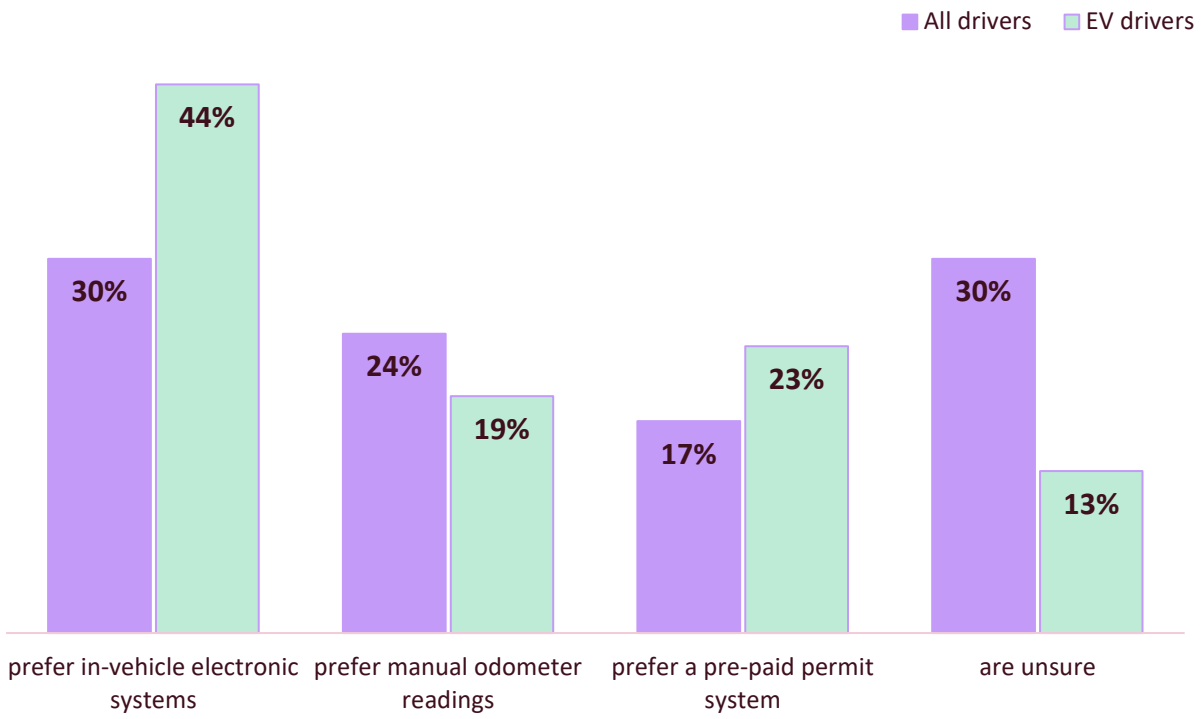
Public opinion on RUC administration

Public acceptance of the design of a RUC system is crucial to its successful and widespread uptake among the community. Transport Australia polling provides insights into Australians' views on RUC calculation methods and data sharing.

Australians are open to a variety of solutions with 30 per cent signifying they would prefer an in-vehicle electronic solution, 24 per cent preferring manual odometer reading, 17 per cent a pre-paid scheme, and 30 per cent unsure. For EV/Hybrid drivers, they significantly prefer an in-vehicle electronic system (44 per cent).[9]

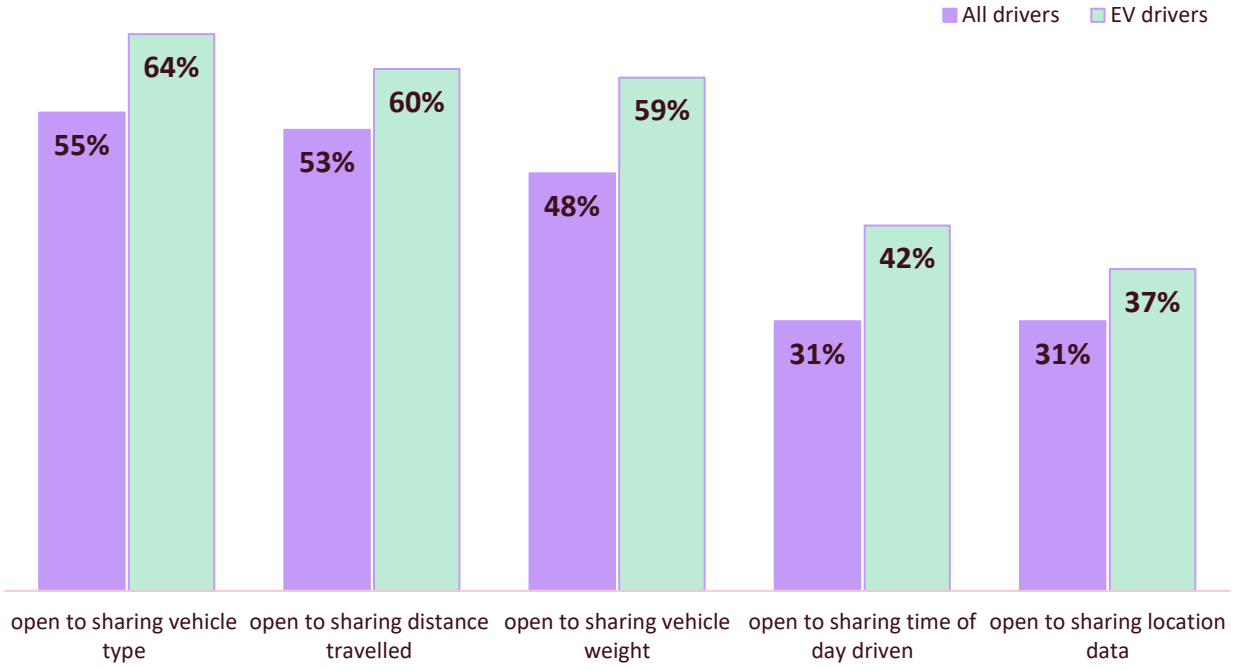


[9] Transport Australia (2026). *Road User Charging: National public poll*



Graph 1. Australian preferences for RUC collection systems

In terms of data sharing, a majority of Australians are open to sharing data on vehicle type and distance travelled, while 48 per cent are comfortable with sharing vehicle weight and 31 per cent are open to sharing location and time of day data.[10] EV/Hybrid drivers are much more open to sharing data across all categories than the general population.[11]



Graph 2. RUC system design[12]

[10] Ibid.
[11] Ibid.
[12] Transport Australia (2026). Road User Charging: National public poll

DATA COLLECTION

The technologies listed in this section can be used for road usage data collection at the vehicle level. This information is required to calculate RUC.

Native connected vehicles

Connected vehicles have built-in e-sims that can register and send real-time data without the need for an external device. This technology can be leveraged to determine road usage and an associated road user charge. Most modern EVs are connected vehicles.

Original Equipment Manufacturers (OEMs), either through data aggregators or directly themselves, can collect the vehicle data required to implement a RUC via digital platforms. The vehicle type, road type, distance travelled, time of day, and location can all be recorded to calculate a road user charge.

The following is an overview of the capabilities, benefits and limitations of this technology.

Capabilities

- Connected vehicles provide data that can enable the implementation of road pricing policies, such as based on distance, time of day, level of congestion, and vehicle type. The key high-frequency data includes vehicle type linked to Vehicle Identification Number (VIN), location, timestamp, and odometer.
- Mass can be inferred by make and model. This solution is largely for cars, in which it can also determine occupancy.
- The high-frequency data allows for the removal of trip kilometres made on toll roads/private roads.

Benefits

- Seamless integration: Once drivers provide their initial consent, data collection is automated and unobtrusive requiring no ongoing effort from the driver.
- The infrastructure for digital RUC already exists in connected vehicles, with the technology ready to go in over 1.2 million cars in Australia including all modern EVs. Thus, the technology does not require external hardware installation.
- Long-term revenue resilience: Digital RUC provides a future-proof revenue stream as fuel excise declines with more EVs and fuel-efficient vehicles on the road with this capability.
- Cost-effective and efficient: Digital RUC minimises administrative costs to the government by leveraging existing in-vehicle technology – no hardware, no stickers, no manual systems.
- Seamless customer experience: Frictionless experience for drivers, eliminating paper-based systems and manual auditing of odometers.
- Smarter infrastructure planning: Datasets from connected vehicles can also be used to rank road usage, target funding and infrastructure, and measure how drivers respond to changes.

Limitations

- Loss of Global Positioning System (GPS) signal, such as in tunnels. This can be resolved by a trip matching algorithm to find the most likely/cheapest route. This provides a fairer way of charging road users.
- Service providers need to have an agreement with OEMs for this model to work and this technology is only available in recent Battery Electric Vehicles (BEVs) – therefore excluding older EV and Internal Combustion Engine (ICE) vehicles.
- Informed consent required at the time of collection.

On-Board Units

On-Board Units (OBUs), often similar in appearance to toll tags, can be used to determine road user charging on both public and private roads by leveraging existing infrastructure and technology. Satellite systems generally position vehicles to avoid the need for dedicated toll points like overhead gantries or cash booths.

OBUs have the capability to calculate the vehicle type, mass, distance, time and in some cases road type and location. They may be used for other functionalities (i.e. congestion charging) as well as road user charging.

OBUs can also be used to support Vehicle-to-Everything (V2X) communication systems for RUC integration. V2X technology enables vehicles to interact with various external factors such as other vehicles, pedestrians, traffic signals, road signs and even construction sites. It can be leveraged to monitor drivers' road usage and apply a road user charge accordingly.

Below maps out common capabilities, benefits and limitations of OBUs.

Capabilities

- Connectivity: Global Navigation Satellite System (GNSS) is used for positioning, Long-Term Evolution (LTE) for communication. Often operates regardless of constant mobile coverage.
- Common data handling features:
    - Geofenced zones, payment objects (e.g. tunnels, bridges), and time-based rules are configured server-side and transferred to the OBU.
    - OBU computes tolling events locally (thick client model) for privacy and resilience.
    - Summary data (i.e. kilometres driven in zones, object usage) is transmitted periodically to toll operators.
    - Detailed trip data can be stored locally for 3–6 months and frequently accessible only by the vehicle owner.
    - Owner can download their own detailed statement.
- Vehicle type: vehicle classification (EV, ICE, mass, etc.) handled in back office.
- Time sensitivity: Supports time-of-day pricing (i.e. peak hour surcharges).

Benefits

- Operates in low-connectivity environments.
- Simple, non-intrusive installation and long battery life. Devices are frequently compact, windscreen-mounted, and cable-free, making it easy to install without professional assistance. Devices operate on battery power for approximately four years, depending on usage. Due to their compact size, there is minimal driver distraction.
- Data control: Full control over data collection, sensor fusion, and handling.
- Retrofits with all vehicle brands: Compatible with old, new and future vehicles.
- Handles tunnels (long and short) and ferries.
- Potential to utilise existing tolling infrastructure – in states with tolling

Limitations

- Some models feature infrequent data uploads due to battery constraints
- Enforcement stations (similar to mobile phone detection cameras) required along roads to check vehicles have a functional device mounted and operational.

Telematics

Telematics devices combine GPS technology, in-vehicle sensors and digital data from the vehicle to provide an overview of vehicle usage, status, and history. Typically, these products have been used as aftermarket fleet management solutions to collect data such as distance, mass, and location, allowing fleet managers to better understand how their vehicles are used. There are many telematics service providers for aftermarket fleet management solutions.[13]

This technology solution is widely implemented in private fleets and could be leveraged to enable a RUC system. The data captured enables automated reporting and billing and frequently integrates with the relevant transport authority systems.

Additionally, heavy vehicles typically utilise purpose-built telematics systems already designed to manage road usage and access, including both general 'under the hood' telematics systems as well as in-cab display systems, which have been used overseas to facilitate pre-booking and payments of RUC charges.

Some widespread capabilities, benefits and limitations of telematics are listed below.

Capabilities

- Ability to charge individual kilometres based on road type, vehicle size, vehicle emissions class, time of day and urban or non-urban location often with high accuracy.
- Typically provides established data portals allowing users to understand their road usage and driving behaviour – allowing some telematics operators to act as either data collectors, data aggregators or both.
- Existing systems can be relatively customisable allowing users to provide consent for type of data being collected and processed.
- Data management provisions vary by providers but often adhere to existing international standards such as the EU's General Data Protection Regulation (GDPR).

Benefits

- The telematics industry in Australia is well established with multiple local operators providing local data management options and supporting infrastructure.
- Typically, systems are flexible for integration with other providers or technology solutions.
- Ability to monitor for other user behaviour items depending on level of information collected directly from the vehicle such as speed or breaking patterns.
- Established payment systems in place allowing some providers to act as a 'one-stop shop'.
- Existing governance structure for telematics industry under Transport Certification Australia's (TCA) National Telematics Framework.

Limitations

- Requires user consent to collect and process vehicle location data.
- Physical devices to be installed in all vehicles requiring users to attend to installation and manage in-vehicle hardware.
- High variability in technology solutions based on provider.

[13] TCA (2026). *Choose a service provider*

Smartphone apps

Smartphone apps are another tool which has been used in some jurisdictions to enable road user charging. The capabilities of this technology solution vary depending on the app. They include technologies that:

- provide direct data capture of vehicle usage to calculate a RUC,
- act as the information/customer portal for users to monitor their road usage, or
- enable RUC through manually uploading photos of vehicle odometer readings.

As such, overall capabilities, benefits, and limitations of RUC mobile apps vary widely by individual solutions and their involvement in direct collection of vehicle usage data.

Below are some general capabilities, benefits and limitations for this type of technology solution.

Capabilities

- When used to directly capture data in vehicles, smartphone apps can support three distinct recording modes:
  - Automatic registration — the app is connected to the vehicle via Bluetooth, CarPlay, or Android Auto, and starts/stops recording automatically when engines turn on or off.
  - Manual registration — users press start/stop in the app.
  - Post-registration — users enter trips retrospectively, including start/stop locations, times, and waypoints. Apps can learn frequently used routes over time to simplify this.
- Capable of minute-based and kilometre-based charging, with time-of-day and zone differentiation (city, suburban, and national zones).
- GPS-based positioning records driving routes and allocates trips to the correct charging zones.
- Users register vehicles in personal profiles in apps and can invite household members, enabling shared-car scenarios.
- Available for both Android and iOS.

Benefits

- Low acquisition cost and high scalability — no hardware needs to be manufactured, distributed, or installed, making rollout comparatively fast and inexpensive.
- Immediately deployable — represents the least costly and most readily scalable technology available.
- Cost-effective for infrequent users — offers a cheaper alternative for people who drive rarely, such as tourists or occasional drivers.
- Flexible communication channels can send direct push notifications and emails to participants, supporting trip reminders and trial management.
- Updatable over time — features can be continuously improved based on user feedback (e.g. post-registration improvements, battery optimisation, relaxed location data requirements for iOS).
- Suitable as a supplement to a physical OBU as a customer portal.

Limitations

- Under-registration of trips affecting revenue and requiring enforcement in a real-world scheme.
- App recordings can stop mid-trip if apps are closed or moved to the background by other apps.
- Vehicles without Bluetooth cannot support automatic registration.
- Companies with multiple drivers sharing one vehicle face added complexity in managing registrations.
- High phone battery consumption due to continuous app usage.
- Registration responsibility falls on the driver, requiring ongoing attention to ensure apps and vehicles remain synchronised.
- Familiarity with apps is required, making it challenging for older users.

DATA AGGREGATION

There are various approaches available for data management and aggregation in the back end to enable electronic RUC calculation and billing. A robust RUC system would need to feature RUC data aggregators as well as an independent RUC data certifier, who has the ability to investigate individual driver RUC data in cases of disputes. A public or private entity may act as a RUC data aggregator.

Providing effective governance for any RUC system will be important to ensure public confidence and the seamless adoption of RUC systems.

The graphic below represents how at a fully implemented stage, this would create an effective RUC ecosystem offering both market choice for road users and management of customer data and regulatory governance processes.

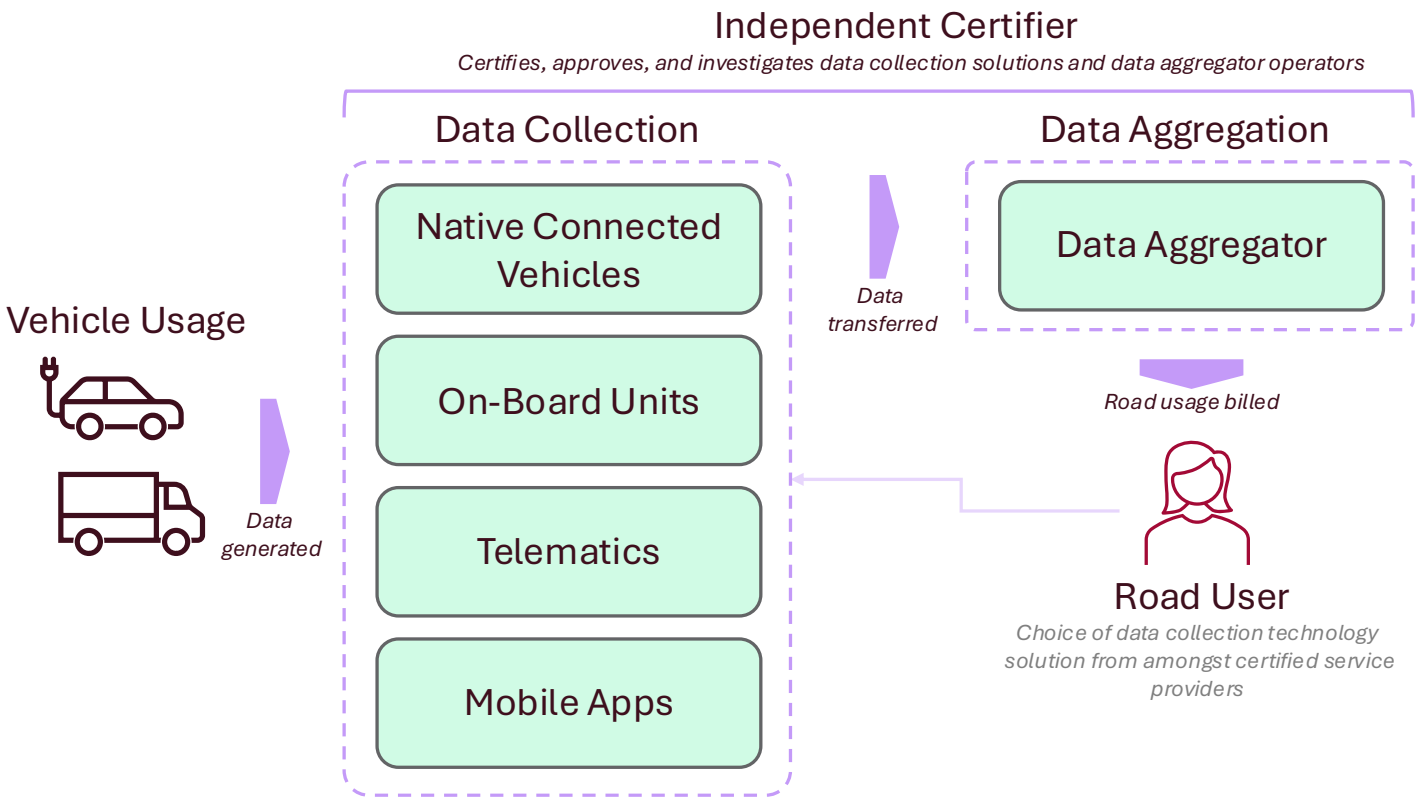


Image 1. RUC ecosystem

Data aggregation can be managed by a range of parties, either public or private. There are already operators in this space either in the form of managing data generated for toll roads or as fleet/telematics operators managing vehicle and trip data.

Comparable examples already exist from the tolling and telematics sectors, which are highlighted in the two case studies below.

Case study - US RUC data aggregation

Several RUC pilots have operated across a variety of US states, informing both RUC programs currently in place as well as multiple planned pilots (e.g. California, Connecticut, Georgia).

Alongside the variety of technology options for data collection, which provide both greater customer choice and technical stress testing, data aggregation for data handling and processing has also been an important facet to test.

Transurban's RUC platform has been utilised across US state pilot programs demonstrating that any data management operator must integrate with multiple devices and data collection solutions including:

- On-Board Diagnostics (OBD-II) plug-in devices (with or without GPS)
- Fleet telematics systems
- Embedded telematics via connected vehicle platforms
- Manual odometer photo readings

Processing this data requires back-end cloud infrastructure that allows relatively rapid analysis down to the road segment level. As part of these trials, RUC fees have then been integrated into customer apps and existing accounts to provide greater transparency of fees, including trip maps, fuel tax credits, and EV fee refunds.

Case study - Australian telematics governance

Austroads currently governs two systems for telematics monitoring in Australia:

- Transport Certification Australia (TCA),[14] which oversees the National Telematics Framework,
- National Exchange of Vehicle and Driver Information System (NEVDIS).

The National Telematics Framework is a national ecosystem for deploying telematics-based digital services. It facilitates collaboration among key parties including:

- Authorities who create applications and use data
- Providers who offer telematics technologies and services
- Operators who use the services
- TCA which administers the Framework, coordinating interactions, setting requirements, overseeing assurance, and managing data and analytics platforms.

The use of TCA and NEVDIS allows three important elements for road use charging:

- Collection of vehicle movement data (via TCA) which includes vehicle registration, time, location, vehicle type and weight (the latter if applicable)
- Linkage of vehicle movement data to vehicle registration data (via NEVDIS) to identify the make, model and registered operator of each vehicle
- Calculation of road use charges based on vehicle movement data and different charging parameters and policy objectives.

[14] TCA (2025). *National Telematics Framework Applications*

International case studies

New Zealand

The New Zealand Transport Agency (NZTA) operates a national RUC system, which has existed in various forms since 1977 through a combination of fuel excise duties and pre-paid per-kilometre fees (for diesel, heavy, and electric vehicles).

Since 2012, the RUC system has also been implemented electronically using a variety of solutions including:

- Connected vehicles
- On-Board Units
- Telematics

Announced in 2025, the New Zealand Government has committed to modernising the system by removing the fuel excise and replacing it with a single road user charging system for all drivers.[15]

As the future RUC system is being built upon a legacy RUC system, some facets, such as manual logging and pre-paid permit system are still maintained at present. While functional for fleet vehicles and heavy vehicles, the New Zealand Government is seeking to shift the system to a fully digital operation.

With New Zealand operating under a unitary government system, any changes or implementation of a national electronic RUC will have effect nationally.

[15] New Zealand Ministry of Transport (2026). *Road User Charges System*

Case studies - New Zealand road user charging

Light vehicle RUC

A connected vehicle trial in New Zealand in 2025 operated under a 3-step process:

- Step 1 - Vehicle owner consent to connect their vehicles
- Step 2 - Vehicle connects to Compass IoT's Native Connect digital platform
- Step 3 - RUC is calculated and billed

Compass IoT worked with NZTA to develop the technology layer for a digital RUC system by:

- Using data from consenting connected vehicles, a RUC is calculated based on VIN, vehicle type, make and model, odometer, location and timestamp without installing hardware.
- Express permission and consent were given by drivers, and in the case of this trial, NZTA did not access location, only total vehicle kilometres and owner details.

By using connected vehicles for RUC, NZTA may look to provide real-time and transparent information to customers and measure exact usage. It also enables the analysis of driver behaviours for planning and managing roads.

This particular New Zealand trial showed that using connected vehicle technology could reduce administration costs by up to 80 per cent compared to paper-based systems.

Heavy vehicle RUC

In addition to the implementation of RUC across modern light vehicles through connected vehicle technology, road user charging exists in New Zealand for heavy vehicles in various forms utilising fleet telematics.

Operators such as MTData and Picobyte offer a third-party RUC platform comprising driver RUC screen and wheel sensor hardware to provide accurate road user charging for heavy transport operators.

This captures and processes multiple determinants of road user charging including distance, vehicle mass, axle configuration, time of use, road class, vehicle type, and location.

Similar products for heavy vehicle fleet management, including options from the operators identified above, currently exist in the Australian market building on compliance requirements administered through the National Heavy Vehicle Regulator (NHVR).[16]

[16] National Heavy Vehicle Regulator (NHVR) (2021). *MTData EWD approved for use*

Scandinavian trials

Norway's early pivot towards EVs has seen significant adoption, with 88 per cent of new car sales in the country being EVs.[17] As a result, Norway has been one of the first national governments to face the challenge of diminishing fuel excise revenue for road maintenance and upgrades. To overcome this, a national RUC system is in development with pilots underway in Oslo.[18] These pilots have used both OBUs and smartphone apps located within vehicles to collect and access vehicle data.

The Norwegian Government is leading the implementation of this future RUC system and has prioritised a fully digital system that builds on the existing national road toll system AutoPASS.[19]

Similarly in Denmark, the Danish Road Toll Trial (2023–2025),[20] conducted by the Technical University of Denmark (DTU) and Sund & Bælt with approximately 2,900 participants, tested both the operational feasibility and behavioural effects of road user charging for passenger cars across a range of kilometre- and minute-based toll models.

[17] IEA (2025). *Trends in electric car markets*
[18] Q-Free (2022). New road user charging system piloted in Norway – with Q-Free as technology provider
[19] ITS International (2025). Q-Free provides ITS software for Statens Vegvesen
[20] DTU and Sund & Bælt (2026). *Forsøg med vejafgifter for personbiler*

Case studies – Scandinavian RUC trials

Norway

Norway has conducted varies RUC trials in recent times. Working with Norway's Public Roads Agency, Statens Vegvesen, technology solutions were designed such that sensitive driving data (e.g. location, time) is protected in line with GDPR data security requirements.

One trial utilised Q-Free's windscreen-mounted OBU, a device similar to existing toll tags or Dedicated Short-Range Communications (DSRC). All data is processed and stored locally on the device, with only summary data transmitted to toll operators.

The focus on data security has sought to ensure that detailed trip data remains under the control of the vehicle owner and is not shared without consent. This was necessary to adhere to EU law and maintain public trust, ensuring transparency in data handling.

A separate 2022 trial in Norway used Kapsch's TollAssist smartphone app acting as a telematics device and user interface, while the Geo-Location Platform (GLP) performs data processing, trip building and transaction creation tasks.

Denmark

The Danish Road Toll Trial used a smartphone app as its primary recording technology, supplemented later by physical OBU boxes and enforced via licence plate cameras. Among other things, the results showed that at this stage of the app's development it proved unreliable as a standalone solution: only around a third of participants used automatic registration consistently, under-registration of trips was widespread, and cross-device compatibility — particularly across Android models — was a persistent challenge.

While smartphone apps offer a low-cost, scalable entry point suitable for occasional and tourist users, a robust national road charging scheme would benefit from physical in-vehicle devices or technologies as its primary technology, with apps playing a supplementary role as a user interface at this stage.

United States

The United States is one of the most advanced jurisdictions in terms of RUC system development due to the number of trials and implementations. However, RUC programs in the US have been delivered in a piecemeal manner by individual states instead of opting for national harmonisation.

The divergence in delivery has led to a variety of processes and solutions on the market and limited interoperability between jurisdictions. Currently there are four US states with active RUC systems in place: Hawaii, Oregon, Utah, and Virginia.

State	Program	Status	Vehicles	Technology
Oregon (2015)	OReGO	Voluntary	EV & some ICE	On-Board Units, telematics
Utah (2020)	RUC UT	Voluntary	EV	On-Board Units, mobile apps
Virginia	Mileage Choice	Voluntary	EV & some ICE	On-Board Units, telematics
Hawaii	HiRUC	Mandatory	EV	Manually recorded

Table 1. US RUC systems[21]

Additionally, each system has adopted different approaches to managing fees. While a per-kilometre charge is consistent across each, local variations also exist. For instance, Hawaii offers users a flat annual fee. Utah, Oregon, and Virgina all incentivise voluntary adoption of RUC by allowing EV drivers to replace existing vehicle registration fees with RUC fees, while Oregon also allows petrol vehicles to claim reimbursements for fuel excise.

In addition to these four states, an additional 12 states have adopted RUC legislation, but have not yet implemented their own programs.

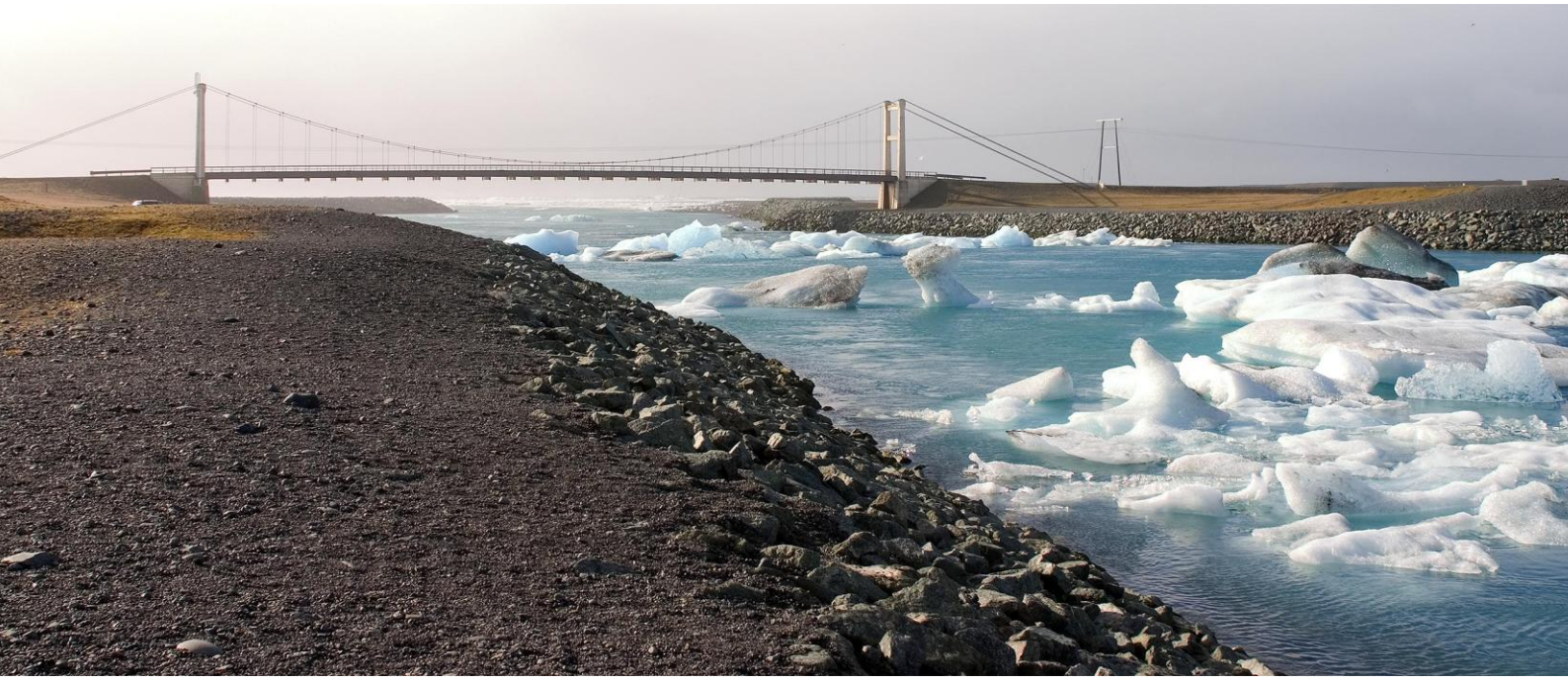
Together this indicates that a relatively fragmented RUC system is emerging within the US, without direct involvement from the Federal Government to coordinate or ensure compatibility across state lines.

[21] National Conference of State Legislatures (2026). *States look to mileage based fees to replace gas tax revenues*

Other international examples

There are several other countries that have trialled RUC around the world. These have typically focused on a smaller subset of vehicles, often trucks, or have opted to implement a RUC with minimal technology interfaces.

Location	Details
Iceland	In 2024, Iceland instituted an EV/Hybrid RUC which was expanded in 2026 to become a national road user charge on all vehicles regardless of vehicle type. Usage is logged manually via odometer readings registered either via a mobile app or in person.
Germany	Germany has increasingly expanded its national Heavy Goods Vehicle toll first implemented in 2005. Applying to federal highways, the scheme has been expanded and now utilises a satellite-based system connecting with On-Board Units within vehicles. The scheme applies to all trucks over a set mass, with exceptions in place for some tradespeople.
Netherlands	By July 2026, the Netherlands will implement a national truck toll. This will apply a per-kilometre fee on all heavy vehicles, with exemptions for some electric trucks. Trucks will be required to have an On-Board Unit installed. Fees generated will be reinvested in subsidies for sustainable trucks and charging stations.
Switzerland	Switzerland has a National Heavy Vehicle Charge (HVC) that uses a variety of existing technology solutions as part of the national tolling system. This program builds on a previous Swiss initiative implemented in 2001 as a policy measure to shift freight from road to rail, with two-thirds of the revenue allocated to rail freight infrastructure.[22]



[22] Research in Transportation Economics (2007). *The Swiss railway investment fund*

Impact on EV adoption

A key concern that is often raised regarding the implementation of a RUC is the potential to discourage the adoption and use of electric vehicles.

Local and international lived experience suggests adopting a RUC is unlikely to affect EV adoption in any meaningful way.[23] Further international case studies of jurisdictions which have implemented a RUC show that adopting a RUC is likely not to affect EV adoption in any meaningful way.

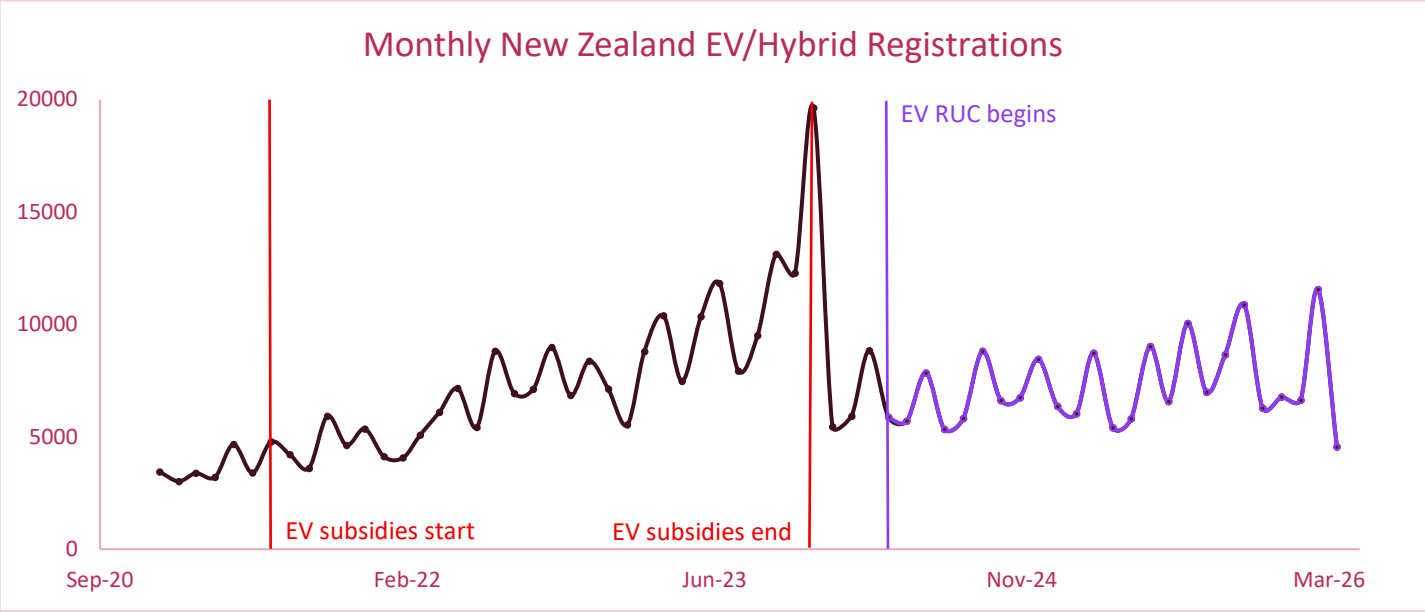
New Zealand

EV registrations in New Zealand since 2024 have been consistently lower than they were in the previous two years. As New Zealand's EV RUC was implemented in 2024, there was some concern that the RUC was the cause for this drop off. However, prior to the RUC's implementation on April 1st, 2024, the New Zealand Government chose to discontinue the popular 'Clean Car Discount' subsidy scheme on January 1, 2024, which had previously rebated up to $8,000 (NZD) of the purchase cost of new vehicles.

Looking into weekly EV registration data,[24] for the three months leading up to the removal of the subsidy EV registrations spiked. This was followed by a steep decline in EV registrations directly following the subsidy's removal. For instance, in the last week of 2023 there were over 400 EV registrations, falling to just 30 EV registrations in first week of 2024.

The announcement of the EV RUC took place on January 16, and no discernible changes occurred in weekly registrations after that. From this, it can be interpreted that consumers rushed to take advantage of the EV subsidy before it was discontinued and its removal subsequently led to the rapid drop off in EV registrations.

Research[25] has shown that 62 per cent of previous EV purchases were the result of this subsidy, which effectively brought demand forward and contributed strongly to the underlying demand for EVs. As such, the removal of subsidies appears to be the primary motivating factor in the fall of EV purchases.[26]



Graph 4. New Zealand Ministry of Transport – Te Manatu Waka - Weekly Low Emission Vehicle report

[23] Transport Australia (2026). *Road User Charging: National public poll*
[24] New Zealand Ministry of Transport (2026). *Weekly Low Emission Vehicle report*
[25] New Zealand Government (2023). *Clean Car Discount driving electrified vehicle uptake*
[26] New Zealand Energy Efficiency and Conservation Authority (2024). *EECA Transport Monitor*

Iceland

Like New Zealand, Iceland's adoption of an EV RUC occurred in tandem with a change in the provision of major EV subsidies. Again, a drop in EV sales was seen, moving from an all-time high of 50 per cent of all sales in 2023, to just 26 per cent of sales in 2024.[27]

However, unlike in New Zealand where there was some delay in policy implementation, Iceland timed these to occur concurrently. With the implementation of an EV-focused RUC taking place on January 1st, 2024, and the conclusion of previous EV Value-Added Tax (VAT) regime the day before. It is, therefore, much harder to understand which factor was the core driver behind the change in EV sales.

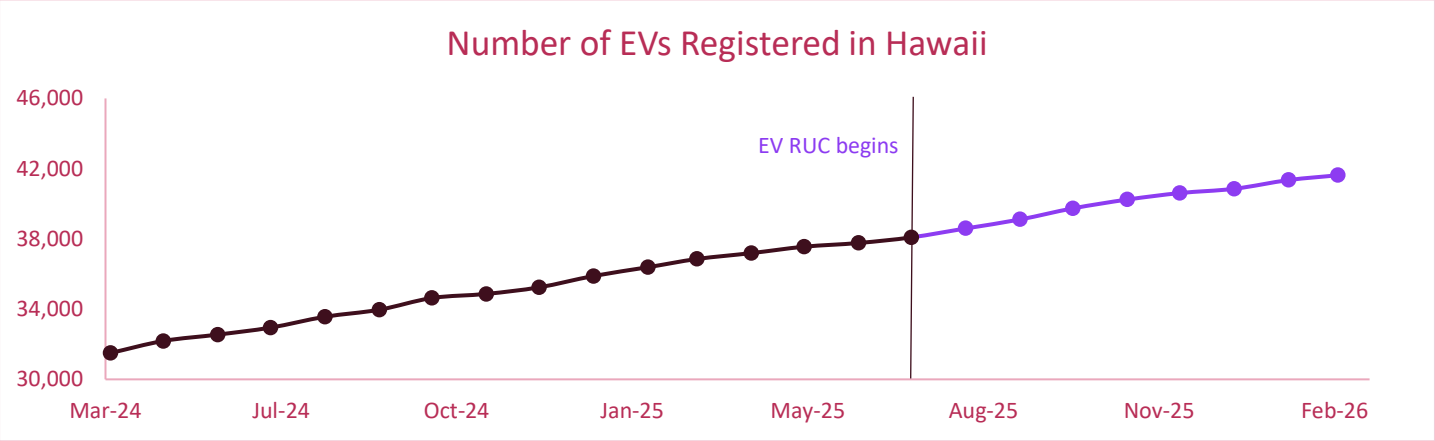
However, by 2025, overall EV sales had climbed to 41 per cent despite RUC implementation, alongside new government EV purchase subsidies in place.[28] The deciding factor in changes to Iceland's EV sales appears not to have been the implementation of a RUC, but changes in the structure of EV subsidies.

Year	EV share of sales	Key policies
2023	*50%*	Uncapped VAT regime in place
2024	*26%*	Removal of uncapped VAT regime, implementation of RUC and introductions of new capped subsidy program
2025	*41%*	Capped EV subsidies and RUC in place

United States

As three of the four US states that have adopted a RUC have not made EV RUCs mandatory, deriving any impact on EV sales is limited. However, it is noted that none of these states have seen a reduction in EVs since RUC adoption.[29] Notably, in the state of Hawaii, the EV RUC is mandatory and appears to be the only international case study of an EV RUC adoption without corresponding changes in EV subsidies. This provides a unique insight into the independent impact of a RUC on EV adoption.

Based on data recording the total number of EVs registered,[30] no changes in EV registration trends appear to have occurred as a result of the Hawaiian EV RUC.



Graph 4. State of Hawaii Department of Business, Economic Development & Tourism- Monthly Energy Trends

[27] Eleport (2026). *EV Sales in Europe Up in Full Year 2025: Complete Overview*
[28] Ísland.is (2026). *Electric car grants*
[29] US Department of Transportation (2026). *Bureau of Transportation Statistics*
[30] Hawaiian Department of Business, Economic Development & Tourism (2026). Monthly Energy Trends - Monthly energy data
[31] Hawaiian Department of Business, Economic Development & Tourism (2026). Monthly Energy Trends - Monthly energy data

Victoria

Victoria is the only Australian jurisdiction to have implemented a RUC for EVs. The scheme was operational from 1 July 2021 until October 2023, when the High Court struck it down on constitutional grounds, ruling that the charge amounted to an excise duty, which states do not have the power to impose.

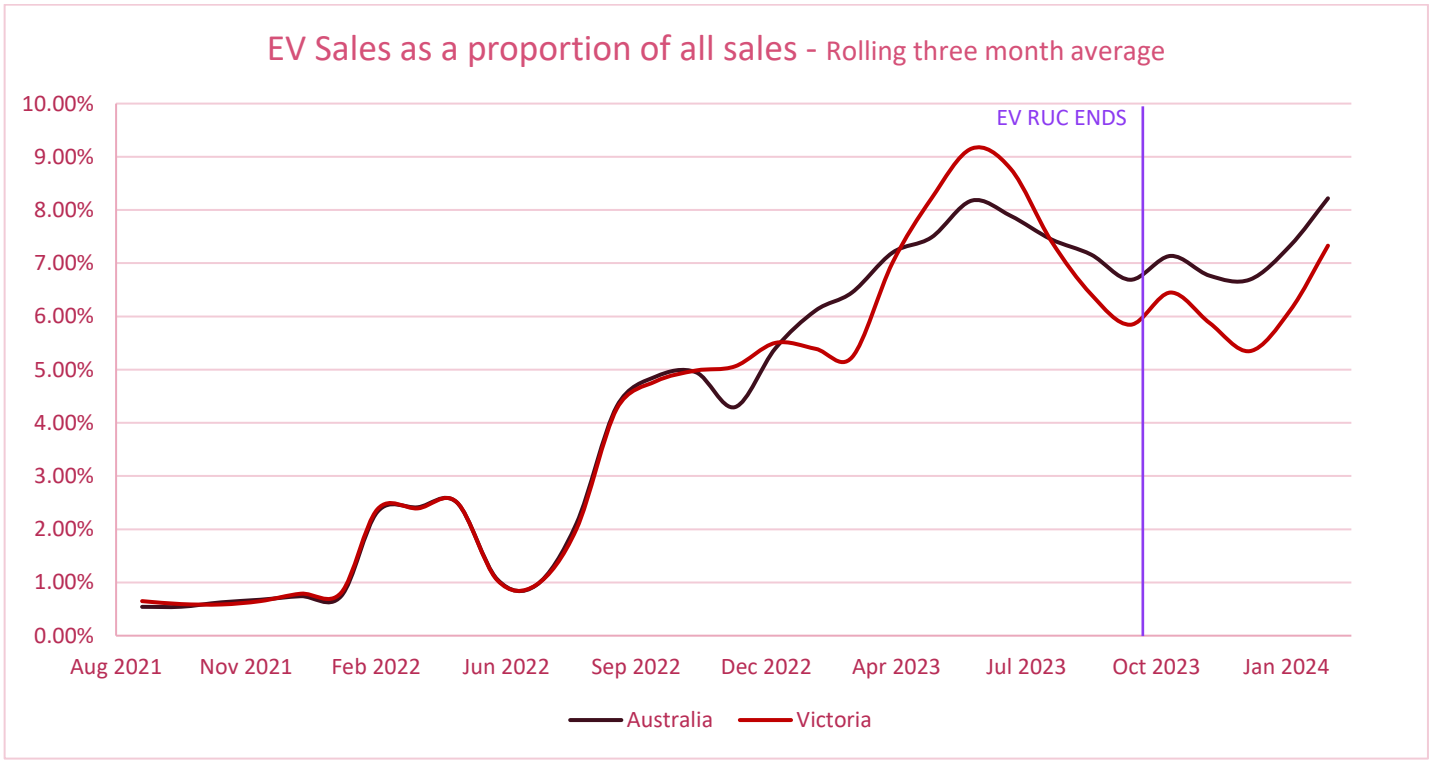
During its operation, the RUC applied a per-kilometre fee to EVs that was collected via odometer readings at vehicle registration.

At the time, concerns were raised that the levy was actively discouraging EV purchases and setting Victoria back relative to the rest of the country.

However, based on EV sales data provided by the Federal Chamber of Automotive Industries (FCAI)[32] as depicted below, it is clear that during this period Victorian EV sales aligned closely with the national average.

If the RUC had been meaningfully suppressing Victorian EV uptake, two things would be expected in the data: Victoria lagging the national trend during the RUC period, and a recovery in relative performance once the charge was removed. Neither of these occurred.

Based on this, the data shows that the EV RUC did not set Victoria back on its path to EV adoption and, hence, should not be regarded as a prohibiting factor to EV uptake.



Graph 5. Federal Chamber of Automotive Industries - EV sales data

[32] Federal Chamber of Automotive Industries data

CONCLUSIONARY REMARKS

The time for road user charging is now. Australia has the technical tools, market settings, governance structures, existing foundations, and most importantly public support to make a RUC work.

With the growing adoption of EVs, we face a once in a generation opportunity to restructure our road funding systems so that it enshrines fairness and keeps our transport infrastructure productive.

Definitions

ANPR	Automatic Number Plate Recognition
BEV	Battery Electric Vehicle
C-ITS	Cooperative Intelligent Transport Systems
DSRC	Dedicated Short-Range Communications
DTU	Technical University of Denmark
EVs	Electric vehicles
GDPR	General Data Protection Regulation
GNSS	Global Navigation Satellite System
GPS	Global Positioning System
HGVs	Heavy Goods Vehicles
HVC	Heavy Vehicle Charge
ICE	Internal Combustion Engine
LTE	Long-Term Evolution
NEVDIS	National Exchange of Vehicle and Driver Information System
NVES	New Vehicle Efficiency Standard
NZD	New Zealand Dollar
NZTA	New Zealand Transport Agency
OBU	On-Board Unit
OBD	On-Board Diagnostics
OEMs	Original Equipment Manufacturers
PHEV	Plug-in Hybrid Electric Vehicles
PKI	Public Key Infrastructure
PII	Personally Identifiable Information
RSUs	roadside units
RUC	Road user charge
SCMS	Security Credential Management System
TCA	Transport Certification Australia
VAT	Value Added Tax
VIN	Vehicle Identification Number
V2X	Vehicle-to-Everything

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