
Road User Charging – A nationally consistent 21st century approach.



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ABOUT THE FCAI

The Federal Chamber of Automotive Industries (FCAI) is the peak industry organisation representing the importers of passenger vehicles, light commercial vehicles, and motorcycles in Australia.

FCAI member organisations are at the cutting edge of innovation, according to Boston Consulting Group 2020 Most Innovative Companies Report¹, five vehicle manufacturers are in the Top Fifty most innovative companies. Vehicle manufacturers are expending extraordinary amounts of money on research and development to commercialise and introduce the latest technologies with advances that will bring quantum changes to the way in which new vehicles will interact with the environment providing innovative mobility solutions whilst enhancing safety for all Australians.

The 50 Most Innovative Companies of 2020

1	Apple (+2)	11	Tesla (-2)	21	Siemens (-5)	31	JD.com (new)	41	Toyota (-4)
2	Alphabet (-1)	12	Cisco (+5)	22	Target (return)	32	Volkswagen (+6)	42	Nestlé (return)
3	Amazon (-1)	13	Walmart (+29)	23	Philips (+6)	33	Bosch (new)	43	ABB (new)
4	Microsoft (+0)	14	Tencent (return)	24	Xiaomi (return)	34	Airbus (return)	44	3M (-5)
5	Samsung (+0)	15	HP (+29)	25	Oracle (return)	35	Salesforce (-2)	45	Unilever (-13)
6	Huawei (+42)	16	Nike (return)	26	Johnson & Johnson (-12)	36	JPMorgan Chase (-16)	46	FCA (new)
7	Alibaba (+16)	17	Netflix (-11)	27	SAP (+1)	37	Uber (return)	47	Novartis (new)
8	IBM (-1)	18	LG Electronics (+0)	28	Adidas (-18)	38	Bayer (-14)	48	Coca-Cola (return)
9	Sony (return)	19	Intel (return)	29	Hitachi (return)	39	Procter & Gamble (return)	49	Volvo (new)
10	Facebook (-2)	20	Dell (+21)	30	Costco (return)	40	Royal Dutch Shell (-10)	50	McDonald's (-29)

Source: BCG Global Innovation Survey.

Note: Returnees have appeared on the ranking before but not in the prior year. Values in parentheses show change in ranking from 2019.

With 60 brands offering 380 models, sold, and serviced by almost 4000 dealers, Australia's automotive sector is a large employer and contributor to our economy, lifestyle, and communities big and small.

Ford Motor Company and Toyota Australia retain some design and engineering facilities in Victoria which support domestic and global new model and accessory development.

Nissan operates a casting plant exporting casting products globally. As well, thanks to world's best local expertise, Australia remains a source of components (including aluminium castings and alloy wheels) which are sold to several global manufacturers.

The reach of the automotive sector is significant: vehicle importation, distribution, retailing, servicing, logistics/transport, and engineering. Support comes from hundreds of supplier companies, employing thousands of Australians.

The Members' Page² has a full list of our member companies

¹ [BCG Global innovation survey 2020](#)

² <https://www.fcai.com.au/about/members>

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Light vehicle transport is an essential component of the Australian lifestyle providing on demand private transport to most Australians enabling high levels of independence and autonomy as well as supporting diverse business operations.

However, as we progress as a society there are several issues that need to be addressed:

- 1. Australia's population is growing and concentrated in cities and suburban areas.**
- 2. Traffic congestion is an increasing problem resulting in various societal issues such as:**
 - a. Increasing travel times;
 - b. Productivity decrease; and
 - c. Emission concentration and associated health issues.
- 3. Road Safety "Towards Zero" results plateauing requiring step change.**
- 4. Fuel excise is the primary automotive taxation revenue is reducing in per vehicle terms.**
- 5. Complex, inefficient and increasingly fragmented automotive taxation measures and proposals across Governments.**

At the same time the automotive industry is changing in dramatic ways and is leading far reaching technological and engineering developments arguably ushering in a generational change in automotive transport solutions for Australians as well as motorists around the world. These trends can be broadly summarised as follows:

- Vehicle Connectivity and Digitalisation
 - Connected vehicles are commencing entry into the market;
 - Cooperative Intelligent Transport Systems (C-ITS) introduction shortly.
- Powertrain electrification through various leading technologies including:
 - Hybrid Vehicle (HV);
 - Plugin Hybrid Electric Vehicle (PHEV);
 - Battery Electric Vehicles (BEV); and
 - Fuel Cell Electric Vehicles (FCEV).
- Increasing levels of:
 - Driver Assistance Systems;
 - Vehicle Advanced Driver Assistance Systems (SAE L2 +); and
 - Progressing towards vehicle automation (SAE L3 +).

Increasingly we are seeing connected vehicles entering the marketplace. Connected vehicles enable vehicles to connect externally with their environment through the mobile network system, either with an embedded Subscriber Identity Module (SIM) or by tethering to the consumer's mobile phone. To a large extent, manufacturers are creating connected features that can enhance the user experience, similar if you like to the evolution of the mobile phone being more than just a tool to make phone calls on. It is this level of connectivity that gives rise to the potential for recording distance travelled and the capability to consider distance-based road user charging.

By way of background, Australia has largely harmonised vehicle regulations with the United Nations Economic Commission for Europe and has to a significant degree followed their vehicle safety developments.

In parallel, automotive related revenue and particularly fuel excise is reducing in per vehicle resulting in a diminishing source of revenue with which to fund amongst other priorities road transport infrastructure and maintenance. This is being exacerbated by increasingly fuel-efficient vehicles as well as the progressive electrification of the light vehicle fleet.

There are numerous automotive related taxes and charges at most levels of government that are inefficient and, in many cases, dampen consumption whilst not being relative to the usage of the vehicles and the impact on the infrastructure that they utilise.

It is these developments that provide Governments with a considerable opportunity to harness and combine the advantages of a number of these megatrends. Planning for the introduction effectively provides a unique opportunity to address several societal issues;

- Commence the phasing out of fuel excise with the introduction of road user charging across all vehicles regardless of powertrain choice.
- Address traffic congestion in the key inner-city areas by introducing congestion charging which could be introduced in several ways, Gantry style using e-tags and or Automatic Number Plate Recognition (ANPR) cameras.
- Addressing traffic congestion by utilising pricing controls that encourage consumer behaviour to make considered choices in areas of high demand particularly during peak periods.
 - Reducing congestion which has many on flow effects such as:
 - Lower concentrated and localised emissions;
 - Lower noise pollution.
- Improve road safety, reduce death and trauma on Australian roads through reduced congestion:
 - Reduce the health and associated costs resulting from road death and trauma
- Improved traffic flow across the city through smart navigation combined with smart infrastructure improving productivity and efficiency.
- Newer electrified powertrains associated with connected vehicles that minimise or eliminate noxious gas emissions in use can contribute considerably to positive environmental outcomes and associated benefits.
- Improve cities liveability through a multitude of benefits.
- Simplify and automate taxation revenue generation.
- Improve consumer confidence through a nationally consistent and considered approach.

Connected vehicles provide a once in a generation opportunity to utilise these systems to support Road User Charging (RUC) to become a practical reality. It will be possible for the vehicle using connectivity to communicate:

- the distance travelled – embedded or tethered vehicle connectivity
- the specific locations of travel where additional road user charges are to be variably applied to minimise congestion (location-based Congestion Charging) through e-tags or ANPR.

There will be challenges:

- Introducing a road user charging system would require a great deal of cooperation and coordination between all levels of Government. However, it will progressively result in a stable, reliable and increasing revenue stream with market expansion over time that could be beneficial to consumers as well as to all Governments.
- From a Government perspective there is significant opportunity to reduce a range of inefficient Federal and State taxes and charges along with the administration reduction and associated cost savings that will result – this could provide the win-win solution.
- From a consumer perspective we need to create benefit from this change otherwise this will be seen as a new tax on technology – which may result in consumers avoiding the technology.
- A Nationally consistent scheme would provide consumer confidence and administration simplicity leading to acceptance if applied appropriately and equitably.

In an overall context, there should be no reason why a well-designed road user charge could not achieve the following:

- Simplify and automate taxation.
- Reduce congestion and improve road safety as a result.
- Promote economic efficiency and as a result;
 - Most pay no more.
 - Some light users will pay less.
 - Motor vehicle users travelling to and from the city could pay more – this will reduce congestion and becomes variable in the future according to demand (if congestion charging introduced).
 - Cities will generally become more liveable.
 - Health benefits for people in and around the major city centres.
 - Continue advancing the electrification of the fleet with associated emission reduction benefits by not selectively applying Road User Charges and dampening demand.

A properly designed Road User Charging system should be introduced in a nationally coordinated and consistent manner that provides certainty for the public as well as the automotive manufacturers designing the in-vehicle systems that will be required to operationalise any system. Road User Charging should be applied to all vehicles in line with the general Road User Charge - principles (refer to Section 10 iii) and not be allowed to be targeted to specific technologies that could potentially distort free market operation or in the worst, reduce uptake by damaging consumer confidence.

Finally, it is important to remember that manufacturers are currently prioritising supply of advanced automotive products with electrified powertrains for markets where governments put policies in place that support the introduction of these technologies.

It is also possible to consider a phased approach which allows for a transition over time:

- Older vehicles that are not connected will continue to use petroleum fuels and contribute to revenue through fuel excise and various other taxes and charges.
- Newer vehicles with connectivity can utilise the Road User Charging system amalgamating the various taxes and charges.
- For congestion charging, either utilise gantry style systems with e-tag technologies or utilising ANPR systems.

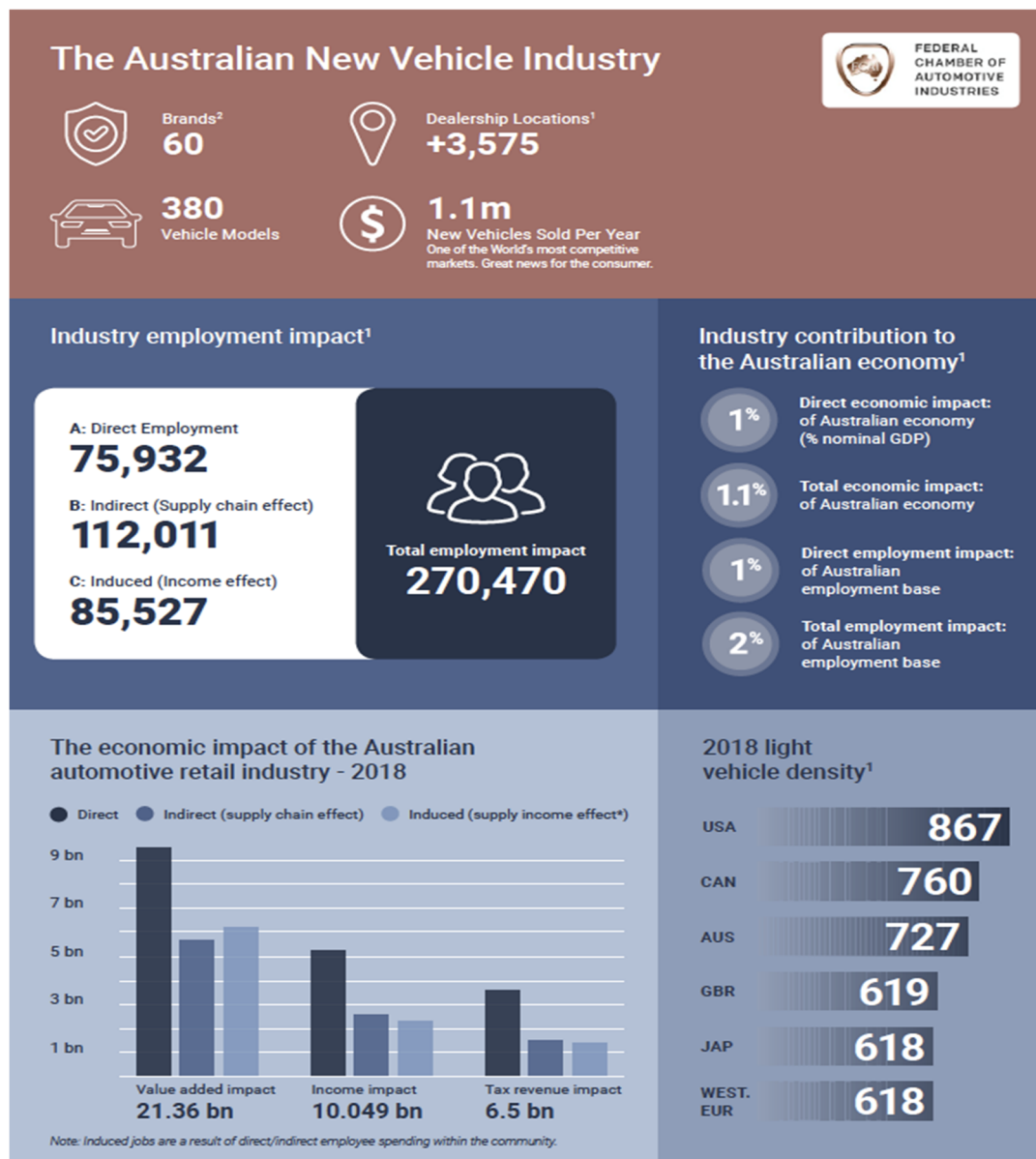
THE MOTOR VEHICLE CONTRIBUTION TO SOCIETY

Particularly in the last half a century, the role of the motor vehicle has become increasingly important as the primary means of transport. It is used throughout the world and has become the most popular mode of transport in more developed countries and Australia is no exception. The effects of the car on Australian society have been profound.

Motor vehicles have introduced sweeping changes to employment patterns. No longer do employees have to live close to their places of work. Motor vehicles have shaped Australian cities allowing the proliferation of expansive suburban areas because of the affordable, comfortable and convenient transport that motor vehicles provide. More recently, the advantages of motor vehicles in providing safe transport protecting health have never been more apparent.

Australia is a large continent that is, by world standards, sparsely populated. There are significant distances between cities with smaller provincial and country towns in between. The motor vehicle has enabled Australians to reside in all areas of the country allowing people to geographically increase their social and economic interactions. It would be reasonable to suggest that Australia today, a vibrant prosperous nation, would not have been possible without the considerable contribution that the Automotive Industry has enabled.

Australian New Vehicle Industry Snapshot



WHAT ARE THE ISSUES THAT NEED TO BE ADDRESSED?

Light vehicle transport is an essential component of the Australian lifestyle providing on demand private transport to most Australians enabling high levels of independence and autonomy as well as supporting diverse business operations.

However:

- Australia's population is growing and concentrated in cities and suburban areas
- Traffic congestion is an increasing problem resulting in various societal issues such as:
 - Increasing travel times;
 - Productivity decrease; and
 - Emission concentration and associated health issues.

- Fuel excise is the primary automotive taxation revenue which is reducing per vehicle.
- Australia has complex and inefficient automotive taxation measures across multiple levels of Government.
- “Towards Zero” road safety results are plateauing requiring quantum changes.

OVERVIEW OF AUTOMOTIVE INDUSTRY CHANGE

The automotive industry is changing in dramatic ways and is leading far reaching technological and engineering developments in response to solving numerous societal goals that include cutting edge innovations to address:

Road Safety

Improving road safety through:

- Advanced active safety features which assist in preventing or minimising crashes;
- Advanced occupant protection to eliminate / minimise the risk of injury in the event of an accident;
- Improved design to minimise injury risks to vulnerable road users;
- Connected vehicles;
- Introduction of Cooperative Intelligent Transport Systems (C-ITS) and particularly Vehicle to Everything (V2X) communications scheduled from 2024-25 introduction; and
- Autonomous vehicle operations that progressively remove human error from the driving task.

Climate Change / Emissions Reduction

Emissions and contribution to climate change:

- More fuel efficient vehicles reducing CO₂ and other emissions;
- Introduction / deployment of Hybrid Vehicles (HV);
- Introduction / deployment of Plug In Hybrid Vehicles (PHEV);
- Introduction / deployment of Battery Electric Vehicles (BEV); and
- Trials of Fuel Cell Electric Vehicles (FCEV).

Private Transport Accessibility

Providing accessibility for all:

- Cost effective motor vehicle transport affordable to most; and
- Developing connected and automated vehicles to improve consumer mobility.

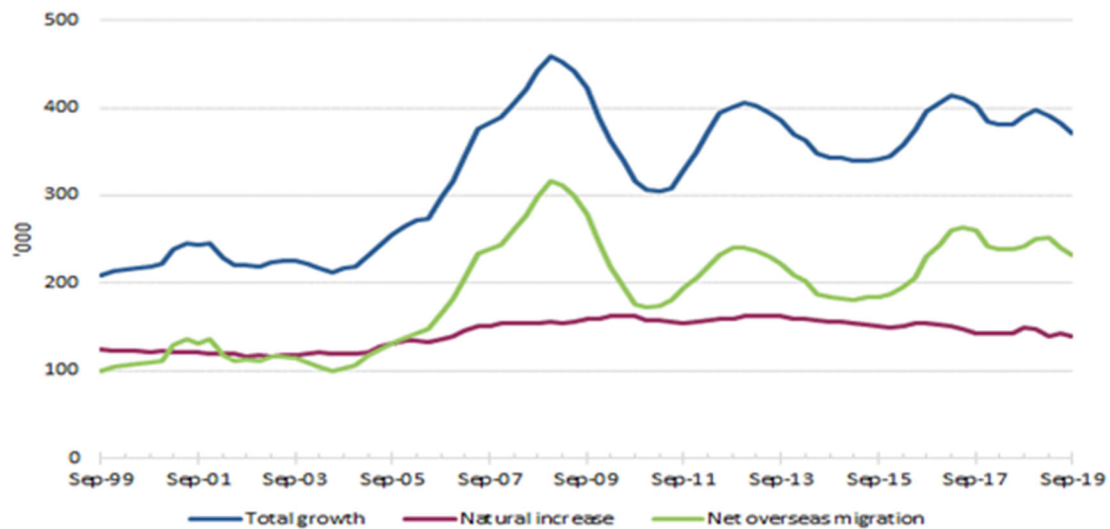
Motor vehicles have contributed greatly to society by providing relatively cost-effective means for fast, reliable and convenient transport of people, goods and services. This has allowed Australians to prosper through social and economic growth that has been the envy of many other countries in the world. In addition, there have been numerous benefits from the ability to provide economical transport links into rural areas of Australia as well as linking our major capital cities.

As our major cities have grown in line with the increasing populations, there has been a need for citizens to have access to convenient and cost effective transport. Of course, this has had some impacts that have resulted in the need for the development of the necessary infrastructure to support this increased population, particularly in the major cities. There has been increased congestion with longer travel times and associated consequent impacts to productivity. This increased congestion incurs additional emissions through increased fuel use all of which affect our major city liveability standard.

Population Growth

Australia's population growth is centred on Australia's capital cities – capital city growth accounted for 79%³ of total population growth in 2018-19. Melbourne +113,480 and Sydney +87,065 had the largest population increases resulting in additional vehicles on city/suburban roads. This contributes to congestion, particularly in periods of high demand such as the morning and evening peak hours in these large cities.

Components of annual population change, Australia (a)



(a) Annual components calculated at the end of each quarter.

Australian Liveable Cities

According to Economist Intelligence Unit (EIU), Australia has recently had the honour of Sydney, Adelaide and Melbourne featuring in the top 10 of Global Liveability Ranking with Melbourne holding the number 1 position between 2011 to 2017 reflecting their widespread availability of goods and services, low personal risk and effective transport and infrastructure systems. As our cities become more congested these rankings, that Australians are rightly proud of, are going to be difficult to maintain without some intervention.

Top 10 Most Liveable Cities 2020

Country	City	Rank	Overall Rating (100=ideal)
Austria	Vienna	1	99.1
Australia	Melbourne	2	98.4
Australia	Sydney	3	98.1

³ ABS 3218.0 2018--19

Japan	Osaka	4	97.7
Canada	Calgary	5	97.5
Canada	Vancouver	6	97.3
Canada	Toronto	7	97.2
Japan	Tokyo	8	97.2
Denmark	Copenhagen	9	96.8
Australia	Adelaide	10	96.6

Increasingly Congested Australian Cities

As our city populations increase with high levels of light vehicle ownership, so does the number of vehicles competing for limited road space especially on major thoroughfares in and around our inner city areas and particularly during the morning and evening peak hours.

Numerous reports have identified congestion as a major impediment to our cities livability, citing productivity, economic and health issues as primary concerns.

Congestion is a significant issue that major cities in Australia are desperately attempting to address, usually with expenditure on large infrastructure projects supporting road transport as well as public transport improvements.

Congestion has numerous impacts including:

- Longer or more variable traffic times – especially commuting;
- Increased environmental pollution – noise, air quality etc. ;
- Increased business costs – service industries & road freight; and
- Decreased quality of life

Even with these large infrastructure projects which take some time to bring to fruition, in many

Australians enjoy a high standard of living

respects Governments are playing catch up as the population continues to increase.

Lack of Incentives to Modify Behaviour

Regardless of where you want to get to around our cities, there are relatively few incentives that contribute to encouraging consumers to consider the mode or timing of their travel according to the demand placed on the assets or infrastructure involved. There are few incentives to time trips outside of peak hours, or to change the mode of transport to ones that more efficiently use space or infrastructure or to those that are more environmentally friendly.

Environmental Impacts

Australia is and will continue to progressively decarbonise its fleet particularly in the private transport sector according to the following automotive trends in Australia:

1. Increasingly fuel-efficient vehicles;
2. Hybrid vehicle sales increasing 94% increase⁴;
3. Hybrid SUVs and LCV expected to increase;
4. Increasing numbers of Electric Vehicle (EV) sales up 149%⁵; and
5. Expected introduction of Hydrogen Fuel Cell Vehicles (subject to hydrogen being competitively and commercially availability).

The automotive industry is rapidly making technological changes to address global challenges to minimise the impact of vehicles on the environment. Improvements in fuel quality standards globally have enabled advanced emission control systems to be employed resulting in wide ranging emission reductions from Internal Combustion Engines (ICE). Additionally, the automotive industry is leading developments to electrify powertrains with Hybrid Electric Vehicles (HEV), Plugin Hybrid Electric Vehicles (PHEV), Battery Electric Vehicles (BEV) and Fuel Cell Electric Vehicles (FCEV). All of these technologies will contribute to enabling consumers to maintain their individual mobility requirements while minimising or eliminating operational environmental impacts. Reducing or ideally eliminating the environmental impact of vehicles plays a significant role in ensuring our cities remain vibrant and desirable.

Health Impacts

Air pollution is responsible for causing 3,056 premature Australian deaths each year, according to one major study.⁶ This represents 2.3 per cent of total deaths in Australia per year – more than the number of deaths from car accidents on our roads. The main causes of death attributable to air pollution exposure are ischaemic heart disease (959), stroke (432), lung cancer (351) and chronic obstructive pulmonary disease (184). The number of healthy life years lost each year due to these premature deaths is calculated to be 27,519.⁷

Current Taxation Arrangements

Fuel excise is the primary⁸ source of ongoing federal revenue from motor vehicles. The fuel excise raised from each vehicle on the roads is a diminishing source of Federal Government revenue as Australians choose more fuel-efficient vehicles and zero emission vehicles and this tendency is expected to accelerate as these newer, more fuel efficient vehicles replace older, less fuel efficient vehicles that are retired from service.

There is an opportunity to replace a myriad of Federal/State/Territory taxes and charges

Fuel excise is the one tax that does to some degree directly relate to distance travelled. However the increasing fuel efficiency of new vehicles does mean that less revenue is generated per kilometre

⁴ FCAI Vfacts December 2020

⁵ NTC CO2 Emissions intensity report

⁶ Begg S, Vos T, Barker B, Stevenson C, Stanley L & Lopez A. (2007). The burden of disease and injury in Australia 2003. Cat. no. PHE 82. Canberra: Australia Institute of Health and Welfare. Available: <http://www.aihw.gov.au/publication-detail/?id=6442467990> [Accessed 25 June 2017].

⁷ Ibid (2007)

⁸ MYEFO_2019_20_Federal

travelled. Globally there is a trend to electrification of the light vehicle fleet as manufacturers strive to meet challenging international emission and fuel economy standards. This trend is having a ripple effect in the Australian market with increasing numbers of HV, PHEV and BEVs sold, each of these considerably reducing or eliminating their use of petroleum fuels.

NTC released their Carbon Intensity Report⁹ which showed that the light vehicle industry as a whole reduced their carbon intensity by 0.2% and, by extrapolation, a reduction of fuel use and therefore a reduction of excise in per vehicle.

FCAI recently announced a voluntary CO₂ member target where brands target long term reductions in CO₂ output in line with the Australian Governments commitment to the Paris 2030 target. This voluntary target is expected to substantially reduce CO₂ in the longer term with a consequent reduction in fuel used and therefore excise contribution.

New technology developments that allow increasing levels of automation will enable more convenient ride-sharing. These have the potential to improve overall network efficiency, as well as individuals' mobility. With this greater access, the marginal cost of trips for many people may reduce and in doing so, may induce higher average demand (Schaller 2017)¹⁰.

Other automotive related taxes and charges include:

- Import duties (Federal)
- Luxury Car Tax (Federal)
- GST (Federal → States/Territories)
- Stamp Duties (State/Territory)
- Vehicle Registration (State/Territories)
- Drivers Licence Fees (State/Territories)
- Compulsory Third-Party Insurance (State/Territories)

The above charges largely are generally not reflective of actual road usage or the real cost of driving on the road (eg. road wear) nor do they provide any influence to user behaviour in terms of road selection, distance travelled, mass transported or time of use relative to the demand for the road space. It should be noted that heavy vehicle charges generally being higher could be argued to be reflective of the impact on the infrastructure, however it is not directly attributable to kilometres travelled.

PREVIOUS REVIEWS – ALL CALLING FOR CHANGE

The Henry Tax Review 2010 called for:

“The existing structure of fuel tax, annual registration and other road-related taxes is designed primarily to raise revenue. These taxes more than cover the direct costs of providing road infrastructure but are not capable of providing specific prices that vary according to location or time of use.”

Infrastructure Partnerships Australia identified that:

“Now is also the time to start talking about what should happen when building new roads is no longer an option. Road pricing should be part of this debate. This is important because decisions taken now may influence the extent to which road pricing could be introduced in the future.”

⁹ <https://www.ntc.gov.au/sites/default/files/assets/files/Carbon-dioxide-emissions-intensity-for-new-Australian-light-vehicles-2019.pdf>

¹⁰ <http://www.schallerconsult.com/rideservices/unsustainable.htm#overv>

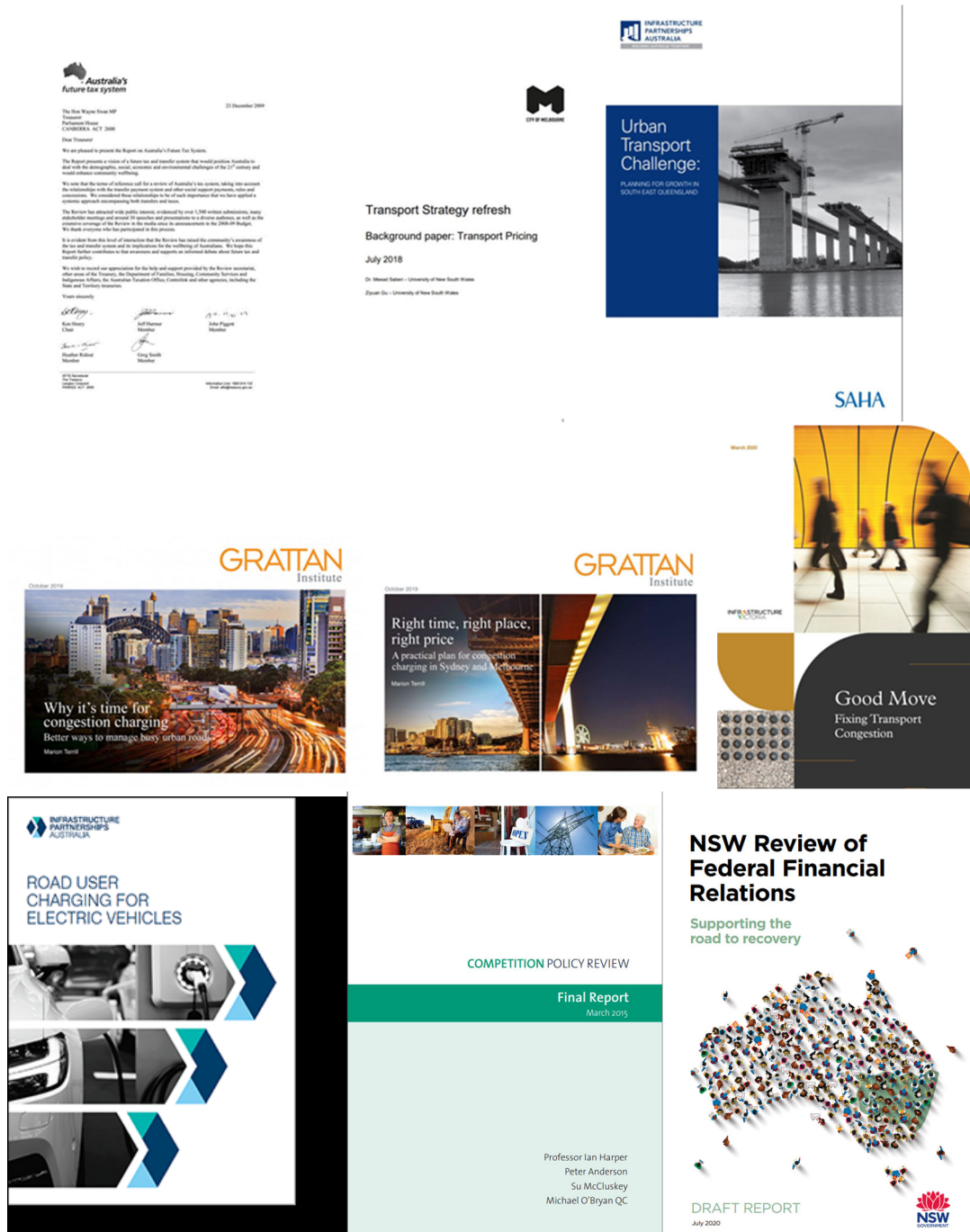
Grattan Institute released two (2) reports in 2019:

1. Why it's time for congestion charging

"congestion is a big enough problem to warrant a new approach, and that the most effective strategy available to state Governments is to charge drivers a modest fee to drive on the highest-demand roads in peak periods."

2. Right time, Right place, Right price

"report lays out a detailed, feasible, and fair congestion-charging scheme for Australia's two biggest cities."



Harper Review 2015

Competition payments could be made available to states and territories in the following areas:

- implementation of reforms to road transport (recommendation 3)—the Government supported the recommendation that cost-reflective road pricing be introduced, and noted that it is a ‘long term reform option’.

Productivity Commission – 2017,

Continuing to push for road pricing reform in its Five-Year Productivity Review, the Commission restated its call for broader road pricing along with the phasing out of current road-related fees and charges (Productivity Commission, 2017).

Melbourne City Council – 2018

Released a discussion paper that proposed a road user pricing scheme in Melbourne that would replace current charges:

What if:

- you could opt-out of fuel excise and car registration fees and choose to pay less and drive less.
- The roads were less congested at the times you needed to drive most.
- A road pricing scheme reduced through-traffic in sensitive areas like neighbourhoods, shopping strips, on public transport routes and in the central city.
- Empty robo-taxis were discouraged by charging higher prices for empty vehicles to use the road.

Infrastructure Victoria – 2020, Good Move – Fixing Transport Congestion

Found that:

“Victoria’s transport network is struggling to meet demand, with congested roads and crowded public transport. Our population is projected to grow bigger and faster, so the pressures on our transport system will only get worse. There needs to be a change to the way Victorians use the transport system if we want to reduce congestion and get the most out of our big infrastructure projects. A change to transport pricing will motivate and incentivise people”

Every review recommends updating to a road user charging system that reflects usage

Infrastructure Partnerships Australia – 2020 – Road User Charging for Electric Vehicles

Over recent years however, the reform case has become increasingly urgent. The uptake of fuel-efficient vehicles has driven a rapid and terminal decline in fuel excise revenue – which makes up a major source of funding for our roads.

With electric vehicles set to become a dealership mainstay over the next decade, fuel excise revenue will simply fall off a cliff, meaning less money to pay for transport investment.

That is why Infrastructure Partnerships Australia is calling for a road user charge on electric vehicles. Applying a simple distance-based charge to electric vehicles will ensure every motorist makes a fair and sustainable contribution to the use of the roads.

NSW Review of Federal Financial Relations – 2020

This report recommended that the NSW Government should work with the Board of Treasurers and state transport departments to design a nationally compatible and fair road user charging scheme for electric vehicles.

Summary of all of the above reviews

The majority of the reviews identified above have generally been focused around economic, competition or infrastructure requirements. Without exception, each of the reviews have recommended that Australia needs to progress towards a more appropriate system, one that imposes a road user charge that effectively charges consumers for their use of the roads and road infrastructure in an equitable and appropriate manner relative to the usage of the infrastructure. A number of the reports extend this concept to increasing charging for high demand assets that are typically congested; in close proximity of our major cities particularly during peak travel periods.

HOW IS THE AUTOMOTIVE INDUSTRY ADVANCING?

The Automotive industry is currently undergoing generational change with numerous technological developments that enable a level of connectivity that has not been possible previously. To a large degree these levels of connectivity are intended to improve the consumers ownership and driving experience, primarily through connected vehicle services that is expected amongst other features to improve vehicle safety through connecting the vehicle with its surroundings. Additionally, this level of vehicle connectivity combined with advanced GPS systems provides the capability for increasing levels of vehicle automation that will progressively remove human error from the driving task. This is expected to substantially improve road safety outcomes. Additionally, connected vehicles have the added potential to minimise congestion through advanced vehicle navigation systems which can re-route vehicles around areas of congestion reduce stationary vehicle tailpipe emissions.

It is this level of connectivity that provides for the capabilities to consider a well designed Road User Charging (RUC) as a 21st century solution in the near term. Such an approach to replacing the multitude of inefficient motor vehicle taxes and charges can correlate the use of the vehicle directly with the road infrastructure used. With advances in tolling technology and the reliability of Automatic Number Plate Recognition (ANPR) allows for the introduction of congestion charging in areas where there is a need to price access according to the demand in some of our congested city areas. The use of price signals can significantly alter behaviour in favour of mass transit solutions.

In line with these developments this is an ideal opportunity to reconsider particularly how vehicle operation is taxed. We are now progressively gaining access to modern efficient technological options that did not exist when motor vehicles and traditional taxation measures were designed and introduced to the market. Most of the State/Territory based taxes and charges do not account for usage volume in any way and certainly do not consider any premiums or discounts based on roadway demand at the time of travel.

Federal fuel excise does rudimentarily account for usage. However as vehicles fuel efficiency improves and vehicles utilise other sources of energy, there is a reduction in the excise paid irrespective of the same usage of the roadways.

Similarly, Hybrid, Electric and Fuel Cell Vehicles, whilst being environmentally positive, do not necessarily contribute the same amount of revenue as traditional powertrains per vehicle for the

development or continued development and use of the infrastructure that they operate on. FCAI acknowledges that there are some studies that estimate the overall financial benefit to Government inclusive of health benefits and reductions to noise pollution to be greater than the contribution to fuel excise. For the purposes of this paper, we acknowledge the wider community benefits of low and zero emission powertrains and consider that whilst there is a significant upfront price disparity between the powertrain options, there may be a need to consider subsidy support to enable these powertrain options to move beyond the early stages of introduction. In the longer term we consider that as a general principle, all users should pay for the infrastructure required to be provided and usage that would ensue.

Whilst full automation of motor vehicles is not likely in the near term, when they are introduced, without other controls, there may be no longer be a need to incur parking charges, the vehicle could theoretically circle, effectively lowering the cost of private vehicle travel and contributing further to increasing traffic congestion and potentially emission levels should they continue to be powered by internal combustion engines. This is compounded by existing congestion charges that apply to inner city carparks – this is likely to have the unintended consequence of automated vehicles continuing to circle waiting for their passengers to return.

Under the current systems there are few, if any, incentive for businesses or consumers to vary their travel based on the demand that exists for the various assets utilised. We acknowledge that there are some limited controls such as heavy vehicle mass and time limits, over dimensional routes and limitations on lane use applicable in various jurisdictions.

Modern electronic tolling systems consists of on board units (OBUs) or retro fitted tags that are carried in a vehicles and have a unique code that is used to identify a customer account. The wireless communications between the on-board unit or tag and road side unit is the most critical function. Having said that Automatic Number Plate Recognition systems have progressed and may be the most appropriate tolling technology into the future.

THE CASE FOR ROAD USER CHARGING

Standard of living with a mature automotive environment.

Australian cities display a high level of traffic control features. Road Traffic Authorities operate sophisticated traffic control systems to manage traffic flow in and around our cities. They utilise a multitude of inputs including traffic cameras, SCATS¹¹ – the world class adaptive traffic control system developed in Australia; in state of the art control centres. In addition, Australian traffic management and enforcement authorities have embraced fixed and mobile speed cameras, point to point average speed camera systems, red-light cameras as well as most recently introducing the worlds first mobile phone camera detection system in NSW.

There are numerous toll roads that are in operation in Australia, all of which use electronic tolling systems that the Australian public has become very accustomed to and frankly now expects as convenient and efficient.

¹¹ <https://www.scats.nsw.gov.au/>

According to a Deloitte 2016 survey¹², Australians have embraced technology with over 84% owning a smart phone, putting Australia in fourth place globally behind Norway, Sth Korea and The Netherlands.

Over a number of years Qantas has transformed the way that Australian air travellers are ticketed on Qantas flights using technology. This has been a great example of using technology to improve convenience and remove friction points within their customer transaction processes. At the same time their ability to reduce operational expenses whilst improving the customer experience has been another example of a technology enabling transformation that Australians have embraced.

Australians embrace technological solutions in their everyday lives

All of the above demonstrates the Australian communities acceptance of advanced technology systems to be utilised in our everyday lives, especially where there is a benefit to be gained such as ease of use or reduced administration costs. Most Australians would now object to slowing down to physically pay a road toll, not to mention the additional cost added to the toll to cover the costs of staffing cash toll booths.

Automotive Developments supporting technological change

In line with the high standard of living that most Australians enjoy, new vehicles made available for sale are well specified with typically high levels of standard fitment and many high end technological features. As an industry, the development and introduction of advanced safety features on most vehicles have proliferated in the Australian market. Consumers continue to embrace the benefits of and direct their preferences to purchasing vehicles with high levels of technology fitted including significant levels of safety equipment, meeting and exceeding minimum mandated safety standards levels.

In addition we are observing that manufacturers are increasingly announcing the intention to or introduction of numerous advanced technologies including:

- Progressively electrifying powertrains (Hybrids, Plugin Hybrids, Battery Electric Vehicles and Fuel Cell Electric Vehicles).
- Increasingly adding Advanced Driver Assistance Systems (ADAS).
- Developing the capabilities to progress deployment of automated vehicles.

It is these automotive developments that make it increasingly possible to consider a 21st century solution to how revenue is raised from the use of motor vehicles regardless of the powertrain employed.

Road User Charging - Principles

As has been recommended by the various other reviews in line with advanced technology systems, there is an opportunity to consider a road user charging system that is reflective primarily on a user pays system.

The primary charging principles could be as follows:

- Distance – overall kilometres travelled
- Mass – reflects the overall weight of the vehicle and economic toll on the road
- Location – higher demand assets will reflect a higher charge than a lower demand asset

¹² https://www2.deloitte.com/au/en/pages/technology-media-and-telecommunications/articles/mobile-consumer-survey-2016.html?utm_source=partner&utm_medium=web&utm_campaign=tmt-mobile-consumer-2016&utm_content=vodafone

- Time – assets with high demand at certain times could incur increased charges

The following table is indicative of the conceptual charging image:

Parameter	Lower \$	Higher \$
Distance Travelled (Rate consistent, cost varies with distance travelled)	Low Kms	High Kms
Vehicle Mass (Rate varies according to vehicle mass)	Low vehicle Mass	High Vehicle Mass
Location Travelled Dependant on Congestion Charging (Inner CBD could attract a higher rate)	Suburban / Rural	Inner CBD
Time of Travel Dependant on Congestion Charging (Rate varies according to demand)	Non-Peak	Peak

N.B. Governments may need to provide subsidies that diminish over time for Low and Zero emission vehicles to encourage uptake. However, as with other vehicles, they also use roads and road related infrastructure, therefore they should contribute to road related revenue raising in the longer term.

Key Points

- The further you drive, the more you will pay – this is consistent with more fuel used meaning that more excise would be incurred and paid.
- The heavier your vehicle is, the rate of charging would be higher – motorcycles and scooters would pay the least whilst larger vehicles and heavy vehicles should pay more; consistent with the mass of the vehicles involved and its real impact and thus cost on road infrastructure.
- Vehicles travelling in suburban and rural areas would generally attract the base charging rate, those travelling on high demand assets such as those in the CBD could incur higher rates of charge – subject to a congestion charging model.
- Vehicles travelling in peak hours in peak direction on higher demand assets would incur higher rates of charge under a congestion charging model.

By utilising such an approach, charges can easily be adjusted according to geographic areas and times of use. This will allow consumers to make a conscious decision as to which method of transport most reflects an appropriate balance their needs. It can also be utilised to modify demand for resources that are in high demand, by using price signals to encourage behaviour change.

What could a Road User Charge look like for passenger vehicles – based on fuel excise only

Currently Fuel Excise is set at \$0.43 per litre + GST

Passenger vehicle total kms travelled 179,761 million kms¹³

Average passenger vehicle fuel consumption 10.8l/100kms¹²

Average passenger vehicle kilometres travelled 13,301kms¹²

Therefore an indicative Road User Charge (RUC) based purely on excise might be in the order of \$0.046/km

¹³ 92080Do001_1202201810 Survey of Motor Vehicle Use, 12 months ended 30 June 2018

On that basis a vehicle travelling the average 13,301kms /year would contribute some \$604/year consistent with the typical cost paid in fuel excise.

Detailed Government modelling analysis would be necessary to consider all aspects of road user charging:

- What is the cumulative cost of excise, with other Federal and State/Territory based charges?
- Understanding the net benefit from bureaucracy reduction.
- Calculating the various rates for differing vehicle types.
- Understanding the affects on various user groups to ensure to assure that disadvantaged road user groups are adequately considered.
- Understanding the effects of removing current inefficient taxation measures and consolidating them into a Road User Charge.

Rather than a myriad of Federal / State & Territory inefficient taxes that each require considerable administration and bureaucracy to manage, with the introduction of advanced vehicle communication systems there is an exciting opportunity to replace these inefficient and in many cases diminishing revenue (in per vehicle) raising methods with a more direct method that reflects usage and promotes economic efficiency.

Road user charging provides a 21st century user pays system

Connectivity and Digitilisation

The vehicle becoming an extension of consumers digital worlds is transforming the way in which we react with vehicles and continue our digital lives. Consumers value connectivity, the ability to receive traffic updates allowing drivers to avoid areas of congestion. Consumers expect to be connected and benefit from improved convenience on a number of levels:

- such as appointment integration.
- music and entertainment choices.
- location specific information and guidance
- emergency and breakdown service interaction
- maintenance reminders, to name just a few.

As technology and testing advances, the automotive industry is progressing with increasing levels of automation of motor vehicles. This will enable automated systems to make driving decisions and increasingly remove the element of human error that is so prevalent in the causative factors of road accidents worldwide and in Australia.

Vehicle Manufacturer challenges

Adding this technology to every new vehicle sold comes at a cost, there is the initial outlay cost of the equipment that needs to be installed as well as the cost of data transmission, storage if necessary and onforwarding as may be appropriate.

It is also likely that there will be some privacy issues to be overcome given that the total distance travelled will need to be associated with a specific vehicle that is owned, although there will be no GPS location information recorded which avoids issues around tracking journeys.

TAXATION – COMPREHENSIVE NATIONAL REVIEW REQUIRED

Equitable automotive taxation

Public sector road-related revenue primarily comprises State-levied vehicle registration, licence fees and stamp duties as well as the Commonwealth-levied fuel excise and GST. Although none of these charges are hypothecated to road funding, they do form a significant part of total Government revenue, a large proportion of which is directed towards road related funding.

Fuel excise is the largest source of road-related revenue however it has been falling for some time in per vehicle.

Fuel Excise

Year	Registered Vehicles ¹⁴	Fuel Excise ¹⁵	Excise/vehicle	% Reduction
2001/2	12.5 million	\$13.9 billion	\$1,011	
2018/19	19.5 million	\$11.8 billion	\$605	40.2%

The decline in fuel excise revenue is attributed to improvements in fuel efficiency of conventionally powered vehicles and also due to the increase in emerging-technology power train vehicles such as HV, PHEV and BEV products. This trend is continuing with statistics of vehicle sales from 2018 to 2019 showing some interesting increases:

- PHEV and BEV sales increased markedly by 149%¹⁶ to 5,800 vehicles with little if any fuel excise paid per km travelled.
- HV sales showed a healthy increase of 93%¹⁷ from 31,191 to 60,417 vehicles with typically a 30-50% fuel excise reduction per km travelled.
- FCAI calculates¹⁸ that 1.06m more fuel efficient vehicles replaced 700k generally less fuel efficient vehicles which were retired from operation in 2019.

These declines will continue to add pressure for Governments to identify alternative sources of revenue. However, it also presents opportunities to design better systems for charging for road use that more closely aligns to the use of the road and road infrastructure assets. A feature of stamp duty and registration charges, in particular, is that they are fixed and do not vary with the extent to

There is an opportunity to undertake wholesale reform automotive taxation

which a person uses road and road infrastructure.

New connected vehicle technology developments that allow increasing levels of automation will enable more convenient ride-sharing – these have the potential to improve overall network

¹⁴ <https://www.abs.gov.au/AUSSTATS>

¹⁵ <https://www.bitre.gov.au/sites/default/files/documents/Bitre-yearbook-2021.pdf>

¹⁶ <https://www.ntc.gov.au/sites/default/files/assets/files/Carbon-dioxide-emissions-intensity-for-new-Australian-light-vehicles-2019.pdf>

¹⁷ FCAI Vfacts 2020

¹⁸ Calculated from Vfacts and the ABS Vehicle census 2020

efficiency, as well as individuals' mobility. With this greater access, the marginal cost of trips for many people may reduce and in doing so, may induce higher average demand (Schaller 2017). Other automotive related taxes and charges include:

- Import duties (Federal)
- Luxury Car Tax (Federal)
- Goods and Services Tax (Federal → States / Territories)
- Stamp Duties (State / Territory)
- Vehicle Registration (State / Territory)
- Drivers Licence Fees (State / Territory)
- Compulsory Third-Party Insurance (State / Territory)

These current charges do not largely discriminate between vehicle types, and are certainly not reflective of actual road usage. Nor do they provide the capability to influence user behaviour in terms of road selection, distance travelled, masses transported or time of use relative to the demand for the roads and road infrastructure.

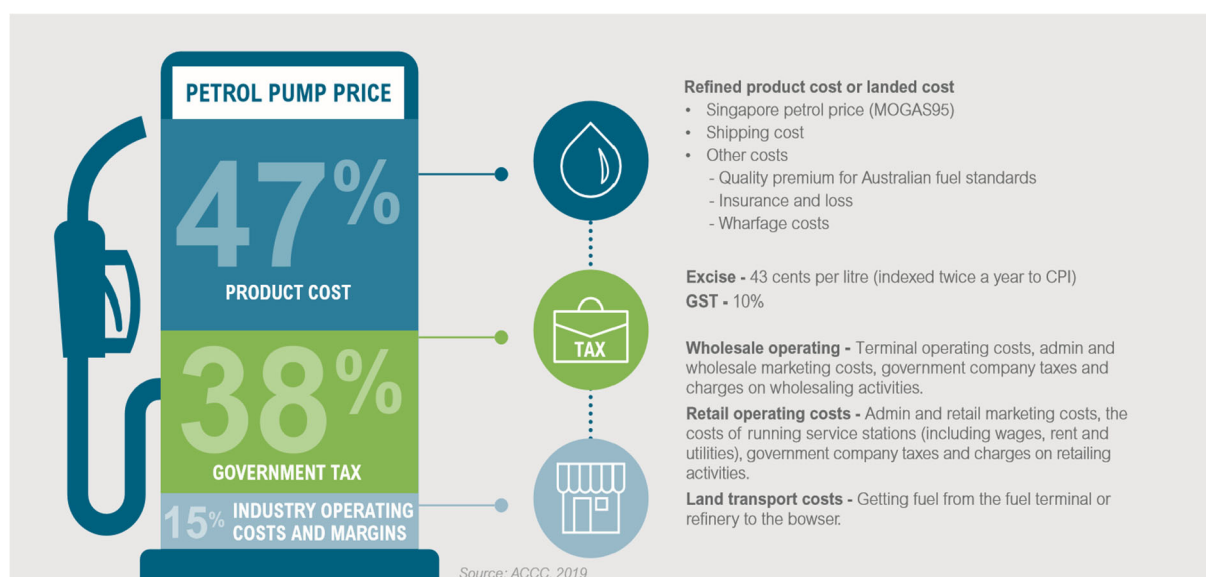
Consumer Awareness of Current Road Related Charges

Currently there is low general consumer awareness of the quantum of the taxation paid by consumers through petroleum excise charges. The following graphic sourced from the ACCC and updated by the Australian Petroleum institute identifies the proportion of the per litre price related to the various components that make up the final retail price.

Unlike GST where it is a requirement to separately identify the GST component paid, excise is not required to be separately identified despite being a major component of transport fuel prices. Most consumers generally acknowledge that they are aware there is a minor taxation component but generally consider the price per litre to be just the cost of the fuel, distribution, retailing and profit margin.

This point is important when proposing taxation reforms that involve fuel excise as any replacement proposal needs to highlight the existing ongoing taxation.

Consumers are generally unaware of the quantum of fuel excise currently paid



HOW TO DEAL WITH TRANSITION

New Vehicle Uptake

The Australian market generally adds just over one million new vehicles per year providing ever improving levels of technology. Many of these vehicles progressively adding including levels of connectivity technology that provides consumers with a broad range of features and safety systems. It is expected through the normal competitive environment that this trend will continue.

Australian fleet characteristics

The average age of vehicles in Australia has been gradually increasing over time. However, according to the Australian Bureau of Statistics 2020 motor vehicle census, currently the average age is:

	2020	2019	2015
Overall Vehicle Fleet	10.4 years	10.2 years	10.1 years
Passenger Vehicles	10.1 years	9.9 years	9.8 years
Light Commercial Vehicles	10.6 years	10.5 years	10.4 years

Based on the above, it is reasonable to assume that the majority of vehicles would be able to accommodate a road user charge that can be electronically managed over a 20 year transition period.

Options for Transition

There are a couple of options to consider:

1. Existing vehicles without connectivity continue to use exciseable fuel, whilst newer connected vehicles transfer to Road User Charge (RUC) systems. This will provide for a smooth transition over time, if the myriad of vehicle related taxes are combined into a RUC, this would provide an upfront on-road vehicle price benefit most likely facilitating introduction.
2. Alternatively, the introduction of a RUC could be implemented immediately for all vehicles. This would require considerations of how to record kilometres travelled on older vehicles, how to rebate any fuel excise payments. Newer connected vehicles would be able to communicate kilometres travelled.

For both of the above options the newer connected vehicles that incur fuel excise, a rebate or off setting system will need to be developed for the transition.

GOVERNMENTAL CHALLENGES

Road user charging, if implemented, needs to be implemented on a national based approach. It is important that in general terms the basic charge per km needs to be consistent regardless of State / Territory borders and consistent with most Government charges being indexed over time. Constitutionally fuel excise is required to be collected by the Federal Government and therefore the imperative to lead a reform program in the face of a diminishing source of revenue has been and is appropriately directed federally To date there has been little if any movement to instigate reform and this may be due to the interconnection and complexities of Commonwealth and State / Territory relations.

Changing to a road user charge does involve a number of constitutional issues such as:

- Section 86 of the Constitution, the collection and control of duties of customs and of excise, and the control of the payment of bounties, are the exclusive responsibility of the Executive Government of the Commonwealth.
- Section 114 of the Constitution prevents the Federal Government from levying a charge on state property – the majority of Australia’s road network are owned by the States and Territories.
- Sections 99 and 51(ii) of the Constitution require that Federal duties be levied uniformly which would make variable road pricing problematic from a federal perspective whilst not an issue for States and Territories.

Government Alignment

There are numerous options available to Governments, not all of which would be palatable to the various Governments involved. However not doing anything will result in a diminishing source of Federal road related revenue meaning that there will be fewer funds being made available to States and Territories for road related expenditure from this source. Already we are seeing fragmented proposals from States looking to bolster State budgets with proposals to Tax Electric Vehicles through the introduction of RUC on Electric and Plugin Hybrid Vehicles.

In the opinion of FCAI these announcements have the primary aim of looking to secure an ongoing revenue stream given that fuel excise is expected to decline as the transport industry progressively electrifies powertrains.

Vehicles with electrified powertrains are at the nascent stage of introduction, they are expensive to produce and therefore the early adopters purchasing these vehicles are doing so typically on ideological grounds rather than based on economics. In fact all levels of Government are reaping high levels of taxation from electric vehicles; they pay more from their high purchase price than the average vehicle - Import Duty, GST, Luxury Car Tax (where applicable) and Stamp Duties.

It is vital that a comprehensive reform that embodies a nationally consistent framework from a number of perspectives:

- Technology
- Administrative requirements
- Compliance requirements

From a State and Territory perspective, if a collegiate approach were to be put in place, it would be advantageous to move to what will be an increasing revenue stream over time as the market continues to grow.

In the absence of Constitutional reform, there would need to be agreement on funds that previously were taxed Federally, that would now be required to be levied at a State / Territory level. Therefore a realignment, of State / Territory / Federal funding arrangements may need to be considered as well as apportionment of a range of taxes and charges including GST. Comprehensive reform is in everyone’s best interests.

Transport Reform

The National Transport Commission (NTC) was established through the *National Transport Commission Act 2003* (NTC Act) and the [Inter-Governmental Agreement for Regulatory and Operational Reform in Road, Rail and Intermodal Transport](#). The NTC is accountable to the [Transport and Infrastructure Council](#) (TIC) and its advisory body, the Transport and Infrastructure Senior Officials' Committee (TISOC). The NTC's role is to lead national land transport reform in support of Australian Governments to improve safety, productivity, environmental outcomes and regulatory efficiency. Austroads is the collective of the Australian and New Zealand transport agencies, representing all levels of Government. It would be instrumental in working with NTC to represent the interests of the States and Territories.

NTC have recently worked through several major reforms including the development of "model law" that can then be consistently implemented by the States and Territories. More recently, the NTC have gained approval and are well down the process for the development of a national regulator and nationally consistent laws to govern Level 3 + Automated Vehicles (AVs).

FCAI believes that a structured and coordinated approach between the Commonwealth and States / Territories is necessary to implement such structural reform.