

# INDUSTRY REPORT

**ECO-DRIVING TRIAL**

—FEBRUARY 2022 EDITION—



# RESEARCH FINDINGS



**5.5%**  
reduction in fuel use  
and GHG emissions



**1,559**  
litres of fuel saved



**3,606**  
kilograms GHG  
emissions avoided



**47,301**  
trips



**700,399**  
kilometres travelled



**444**  
participants



**96%**  
reported their  
driving improved





# INTRODUCTION

We're committed to sustainability and working hard to reduce customer emissions. In order to deliver on our UN Sustainable Development Goals, we are reducing our greenhouse gas (GHG) emissions and working urgently and comprehensively to achieve net zero GHG emissions by 2050.

While not technically part of our indirect (Scope 3) GHG emissions, we are determined to help our customers drive more sustainably—reducing their emissions and using less fuel. In addition to reducing environmental impact, driving more sustainably is also more affordable.

As it will be some time—possibly around 2030<sup>1</sup>—before electric vehicles (EVs) reach price-parity with internal combustion engine-powered vehicles (ICE), action is urgently needed to help reduce GHG emissions from Australia's current 99% ICE vehicle fleet.

Australia's passenger vehicle fleet is large (about 15 million<sup>2</sup>), meaning a modest reduction in fuel consumption could deliver significant GHG emission reduction and make a meaningful contribution towards achieving Australia's net zero target.

Eco-driving complements efforts to electrify the motor vehicle fleet, as well as keeping traffic freely moving and therefore generating lower vehicle emissions, on our road networks. By helping drivers become more aware of surrounding traffic and planning their journey, eco-driving is also safer driving.

<sup>1</sup> Source: [afr.com/companies/energy/electric-vehicles-set-for-range-parity-with-petrol-cars-by-2024-20220202-p59t79](https://afr.com/companies/energy/electric-vehicles-set-for-range-parity-with-petrol-cars-by-2024-20220202-p59t79)

<sup>2</sup> Source: [abs.gov.au/statistics/industry/tourism-and-transport/motor-vehicle-census-australia/latest-release#:~:text=There%20were%2020.1%20million%20registered,up%20from%2020.9%25%20in%202016.](https://abs.gov.au/statistics/industry/tourism-and-transport/motor-vehicle-census-australia/latest-release#:~:text=There%20were%2020.1%20million%20registered,up%20from%2020.9%25%20in%202016.)

## What is eco-driving?

'Eco-driving' involves using a range of techniques and behaviours to lower fuel consumption. Chief amongst these is 'smooth driving', which involves smooth acceleration and braking, and ensuring optimal gear selection for manual vehicles. It also includes techniques such as maintaining correct tyre pressure and removing unnecessary dead-weight.

Techniques include:

- **Smooth driving:** allows optimal engine speeds, with engines using the smallest amount of fuel possible to achieve the required speed.
- **Tyre pressure:** tyres are inflated to the correct pressure as per manufacturers recommendations, which ensures that an appropriate amount of tread maintains contact with the road surface. Under-inflated tyres are less safe and increased rolling resistance means that more engine power, and therefore fuel, is needed to maintain the desired speed.
- **Deadweight removal:** not carrying around unnecessary weight. A heavier vehicle requires more energy, and therefore fuel, to achieve and maintain required speed.

# OUR APPROACH

In 2021, we partnered with Australian technology company GOFAR, to run a two-stage eco-driving trial in Queensland.

Stage 1 involved a trial with approximately 50 Transurban employees, with an intention to proceed to a larger Stage 2 trial if this was successful. Both stages involved fitting a telematics device into the on-board diagnostic (OBD2) port, setting up a GOFAR account and smartphone app, and connecting the visual feedback device known as the 'Ray' to the OBD telematics device.

Before we began, rigorous safety, privacy and cyber-security evaluations were undertaken to ensure any potential risks were identified and then eliminated or appropriately managed.

Using a two-stage approach increased the likelihood of success and helped manage risks.

## Stage 1—Confirming our approach

Our first phase of research was established to confirm the merits of the technology and identify and resolve any issues before involving our customers.

Transurban employees and contractors from Queensland, who were regular drivers, were invited to participate. Commencing in February 2021 and taking place over four weeks, a total of 46 employees completed the eco-driving trial.

Key lessons learnt and addressed in Stage 2 included ensuring safe cable routing between the 'Ray' and OBD2 port, and providing extra adhesive to attach the 'Ray' to instrument dash.

## Stage 2—Comprehensive customer research

Three groups of 30,000 Linkt customers in Queensland were selected as potential participants, targeting those that were frequent users of our network.

The first group was invited to join in mid-April 2021 and we met our target of 500 participants within 24 hours (given this response, no further recruitment activities were undertaken).

Participants were sent a complimentary GOFAR package. Support, including installation instructions, was made available throughout the trial.

## Data transmission

Data on engine performance—including fuel consumption—is sent from the vehicle's engine management system to the telematics device inserted into the OBD2 port; from there the information is sent in two second intervals to the cloud-based GOFAR database via a 4G mobile data connection.

## Why did people join the study?

Almost 90% of Stage 2 participants were interested in learning about eco-driving techniques, saving money or reducing fuel consumption. A small proportion (11%) saw potential benefits in terms of safer driving.

FIGURE 1: PARTICIPATION MOTIVATIONS



## About GOFAR

The GOFAR ecosystem has three components:

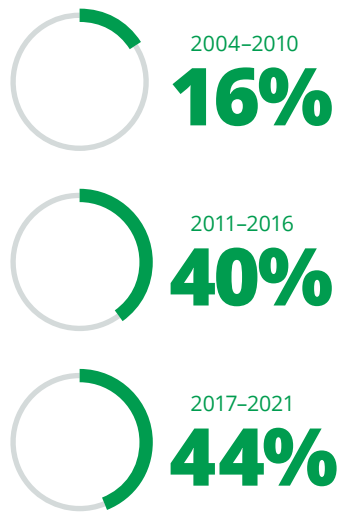
- a telematics device that plugs into a vehicle's OBD2 port
- the 'Ray' and
- a smartphone app.

The 'Ray' is a small device that is stuck on top of a vehicle's instrument cluster and connected to the OBD port. It uses light and colour to safely communicate to the driver how they are driving.

The aim is to keep the lights on the device blue, which means you are driving optimally. If the light turns red, then drivers know they may be stop-starting too often, braking too harshly, accelerating too aggressively or driving over the speed limit.

[Find out more about GOFAR](#)

FIGURE 2: CUSTOMER VEHICLE AGE



### Customer vehicle type and age

To participate in the trial, customers needed to have a car, ute or SUV which had an OBD2 port (manufactured post-2004). Interestingly, the vast majority (84%) of participating customers had vehicles less than 10 years old, which are generally more fuel-efficient than older models.

### Data collection and customer interaction

The GOFAR ecosystem allowed us to capture a comprehensive range of data, including fuel consumption, speed and emissions (Appendix 1).

Participants were given four weeks to establish a baseline for fuel consumption. We advised participants to initially only connect the telematics unit, not the 'Ray', as to ensure it didn't unduly influence their driving behaviour.

Once the baseline period was complete, the participants entered a five-week education period. They were asked to connect the 'Ray' and three eco-driving 'course' (content) emails were sent (Appendices 2-4). Each email focussed on a specific eco-driving behaviour or technique and contained a short video summarising the concepts.

Anonymised data were collected and transmitted to GOFAR via the participant's connected phone over the full nine-week duration of the trial. To ensure safety, results did not appear on a participant's GOFAR app until the end of a trip.

The eco-driving trial research produced fuel savings, reduced emissions, and improved customer driving behaviours.

### Eco-driving education videos

- **'Smooth driving' (Course 1)**—provided guidance on how to reduce harsh braking, keeping a gap of three seconds from the vehicle in front.

[▶ Watch now](#)

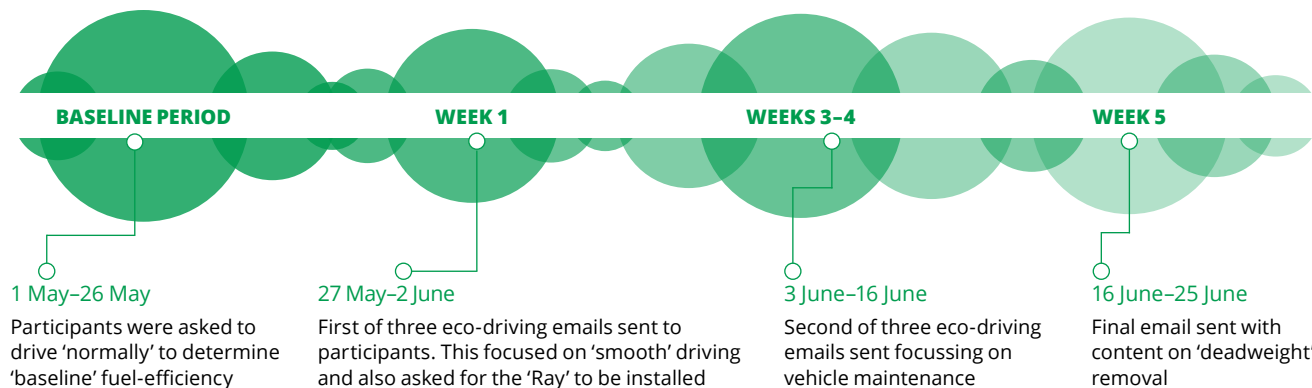
- **Tyre pressure (Course 2)**—focussed on the importance of ensuring tyres are correctly inflated and associated fuel economy benefits.

[▶ Watch now](#)

- **Reducing deadweight and drag (Course 3)**—addressed removing extra weight, limiting the use of air conditioning and other electrical equipment and minimising air resistance such as keeping windows closed and removing roof racks when not needed.

[▶ Watch now](#)

FIGURE 3: STAGE 2 TIMELINE





# RESULTS

The eco-driving trial research produced fuel savings, reduced emissions, and improved customer driving behaviours.

Specifically we found:

- 444 participants completed the Stage 2 trial. Of these, two-thirds (293 participants) used the 'Ray' visual feedback device. The remaining participants completing the trial did not activate the 'Ray' for unknown reasons.
- Data were collected over 30 million trip segments, more than 45,000 trips and greater than 40 vehicle makes/models providing a robust data set for analysis.
- 700,399 kilometres travelled over the course of the trial. This represents an average of 1,577 km per participant, providing confidence in the validity of the results. Around 8% of travel occurred on Transurban roads.
- 5.5% fuel efficiency improvement<sup>3</sup> overall, with participants saving around 1,559 litres of fuel over the course of the trial and avoiding 3,606 kg of GHG emissions.

- If participants maintained eco-driving behaviours learnt through the trial, they could collectively avoid 74 tonnes of carbon emissions and save \$50,000 per annum on fuel.
- Baseline fuel consumption of participants averaged 8.8 L/100km—possibly due to most participants' vehicles (84%) being less than 10 years old. This average consumption figure is lower than the Australian average<sup>4</sup> of 11.1 L/100km suggesting that even higher fuel savings may have been achieved if the sample was more aligned with the national average.

The trial generated positive media interest, including [an exclusive on Nine News Brisbane](#). No safety, cyber-security or privacy incidents were reported from either stage of the trial.

## Participant feedback

A post-trial survey was undertaken with 20% of participants (91) responding. Participant's feedback consisted of five key themes—the GOFAR ecosystem, driving feedback, eco-driving techniques, the trial generally and its value (Appendix 5).

Key findings included:

- 96% indicated their driving had improved because of the trial
- 88% rated their eco-driving proficiency as good or excellent
- 70% found the 'Ray' provided the most assistance during the trial. A further 27% said the GOFAR app helped
- 80% found the educational eco-driving email content useful
- 95% agreed the trial met their expectations
- 100% plan to continue driving in a more sustainable way in the future.

<sup>3</sup> Measured from baseline to end of eco-driving period and based on results from participants using the 'Ray' visual feedback device. Baseline fuel consumption was 8.83 L/100km and trial fuel consumption was 8.34 L/100km (a reduction of 0.49 L/100km). Those not using the 'Ray' achieved an average 1.5% fuel efficiency improvement.

<sup>4</sup> Source: [abs.gov.au/statistics/industry/tourism-and-transport/survey-motor-vehicle-use-australia/latest-release](https://abs.gov.au/statistics/industry/tourism-and-transport/survey-motor-vehicle-use-australia/latest-release)

# CONCLUSION

With an overall fuel efficiency improvement of 5.5%, the trial has shown that eco-driving concepts have merit and can deliver meaningful fuel consumption savings, and therefore GHG emission reduction.

If the trial result was maintained for 20 conventional internal combustion engine vehicles (ICE), this would provide the same emissions reduction as one electric vehicle (EV). If this result was applied to Australia's light and commercial vehicle fleet, around 3 million tonnes GHG emission reduction could be realised annually<sup>5</sup>. This would be an important contribution to meeting the country's net zero targets. The low cost of eco-driving also makes it more accessible across Australian society.

While passenger vehicles have become increasingly fuel-efficient over time, there appears to be merit in actively promoting eco-driving now versus simply waiting for cars

to get more efficient or for EV and zero-emission penetration to increase in the Australian vehicle fleet.

It is expected to take eight years, until 2030, for ICE vehicles to get 15% more efficient and that vehicle costs will increase by \$1,000–\$2,000<sup>6</sup> accordingly. Based on our results, an eco-driving approach could promptly deliver 30% of this gain, for 10% of the cost. Moreover, ICE vehicle eco-driving skills are transferrable to EVs and would help address widely held range concerns.

Based on feedback from participants, it is possible that the results could be further enhanced by providing more comprehensive education materials (covering additional techniques such as peak-hour driving and coasting), as well as providing individualised feedback to drivers.

## Next steps

The trial results have been published on the Transurban and GOFAR websites and will be included in Transurban's FY22 Corporate Reporting suite.

To increase the potential benefits of the trial to a broader audience the following will be undertaken:

- Eco-driving tips continue to be shared via Transurban's social media channels; providing an opportunity for all drivers to benefit from the positive trial results.
- Eco-driving education content will also be provided on the Transurban website.
- The broader roll-out of eco-driving initiatives will be considered as a part of Transurban's forthcoming Sustainable Driving Program, which is likely to also include measures aimed at accelerating the uptake of zero emissions vehicles in Australia.

*“Teaching drivers how to get where they need to while burning less fuel on the way is as close as one can get to an economic free lunch.”*

*Ian Davidson, Co-founder, GOFAR*

<sup>5</sup> Based on the estimated 59MT of emissions in 2016 (source: [greenvehicleguide.gov.au/pages/Information/VehicleEmissions](https://greenvehicleguide.gov.au/pages/Information/VehicleEmissions))

<sup>6</sup> Source: [abs.gov.au/statistics/industry/tourism-and-transport/survey-motor-vehicle-use-australia/latest-release](https://abs.gov.au/statistics/industry/tourism-and-transport/survey-motor-vehicle-use-australia/latest-release)

# APPENDIX 1

## Data parameters

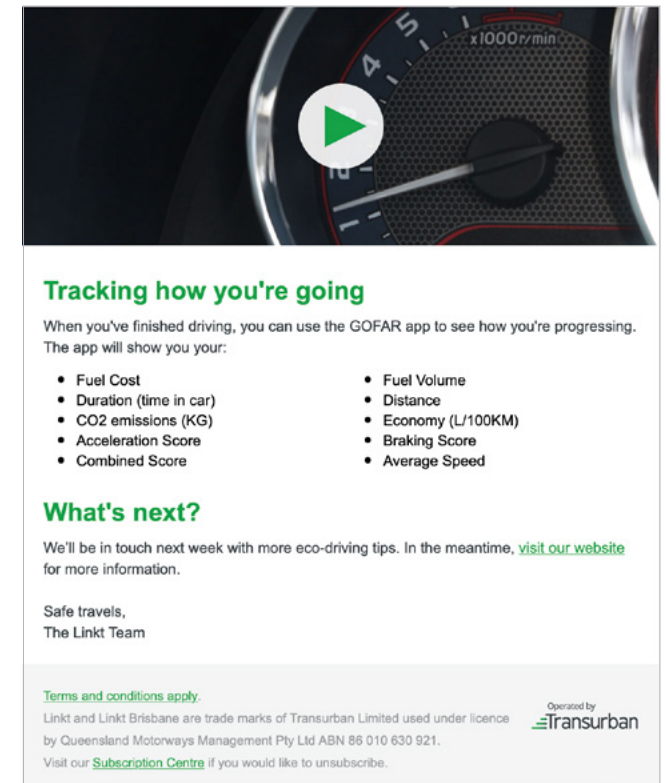
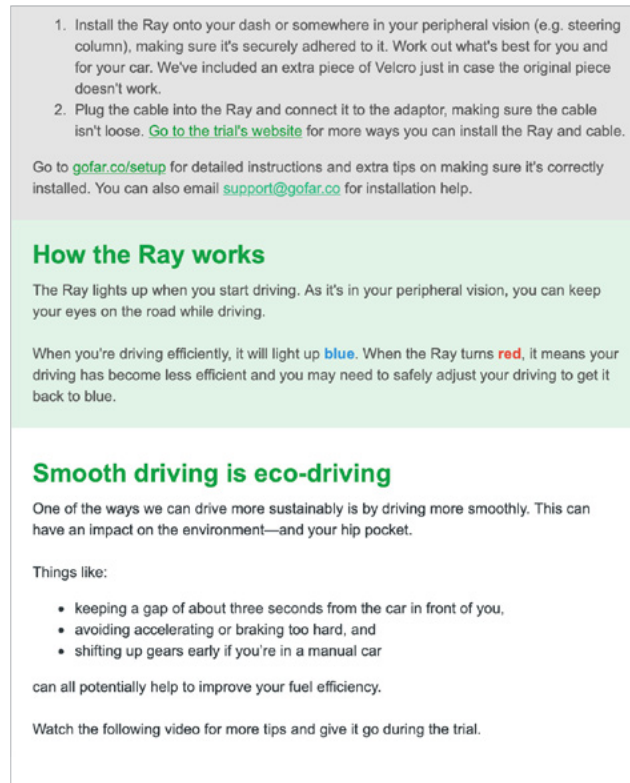
<b>Data type</b>	<b>Description</b>
acceleration/braking g force	Acceleration and braking data
coasting	Coasting event—no acceleration or braking
day	Date/time of trip
distanceloginterval	Distance travelled
idling	Car stationary with engine on
latitude	GPS coordinate
litresloginterval	Cumulative fuel usage
longitude	GPS coordinate
make	Vehicle make as provided by participant
model	Vehicle model as inputted by participant
speed	Max speed at the point in time
speedlimit	Speed limit within the area
tripid	Meta data relating to specific trip
tripindex	Data point from within trip—collected every 2 seconds
vehicleid	GOFAR specific vehicle ID
xaxisacceleration	Accelerometer
yaxisacceleration	Accelerometer
year	Vehicle year as provided by participant



# APPENDIX 2

## Email 1—'Ray' installation and 'smooth' driving

Three eco-driving education emails were sent to participants during the Stage 2 trial.



# APPENDIX 3

## Email 2—Tyre pressure


Three eco-driving education emails were sent to participants during the Stage 2 trial.

View this email [online](#)

**Linkt** [My Account](#)

### Eco-driving trial

Check your tyres



Hi Test\_first\_name,

We understand that changing your driving habits for the long-term can be tricky, but we hope you're picking up some valuable new driving behaviours so far.

This week, we look at the impact tyre pressure has on the environment, and your wallet.

### Check your tyres

Low tyre pressure is a safety risk—but did you know it can also cause you to burn extra petrol while driving?

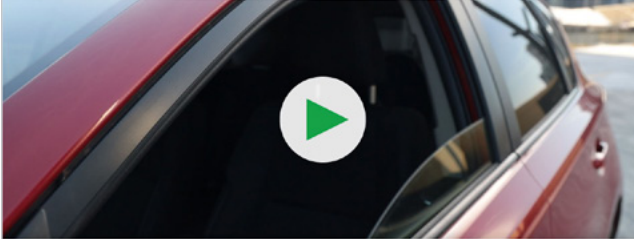
Under inflated tyres can reduce a car's fuel efficiency by as much as 3%, but the good news is that a monthly tyre pressure check costs you nothing and it's easy to do.

You can sometimes tell your tyres are under inflated by how the handling of your car feels. However, it's not always the case. So, how can we make sure our tyres are as efficient as possible?

### Make your tyres go that extra mile

- Remember—a tyre doesn't need to look flat to be under inflated.
- Refer to your vehicle's sticker or owner's manual to familiarise yourself with the required tyre pressure level for your car and test it regularly.
- Check your tyres at least once a month and before embarking on big trips.

For some more tyre pressure tips, watch the following video and give them a go.



### What's next?

We'll be in touch in a fortnight with more eco-driving tips. Remember, you can visit our website to see how everyone in the trial is going.

If you need any help with this eco-driving trial, [get in touch with us](#).

Safe travels,  
The Linkt team

[Terms and conditions apply.](#)

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Visit our [Subscription Centre](#) if you would like to unsubscribe.

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**Transurban**

# APPENDIX 4

## Email 3—Reducing deadweight and drag

Three eco-driving education emails were sent to participants during the Stage 2 trial.

View this email [online](#)

**Linkt** [My Account](#)

### Eco-driving trial

Reducing deadweight and drag

Hi Test\_first\_name,

You're almost there! Hopefully, you've been putting into practice some of the things you've learned over the past few weeks.

This week, we look at how unnecessary deadweight and drag can potentially impact a car's fuel economy.

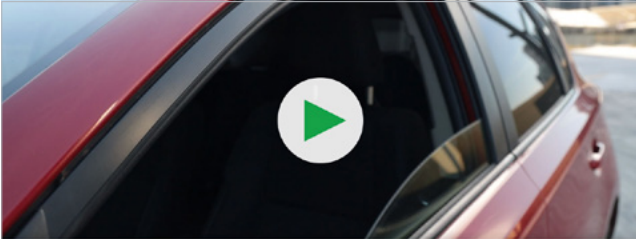
### What's holding your car back?

Small changes like:

- limiting your use of air con and other electrical equipment,
- removing extra weight from your car—as it could increase fuel consumption, and
- minimising resistance—like roof racks or open windows,

can all help to potentially reduce your car's impact on the environment and may help you save a bit of money at the petrol station too.

For tips on limiting deadweight and drag, watch the following video and give them a go.



### What's next?

Just because we're almost at the end of the eco-driving trial, it doesn't mean learning about sustainable driving behaviour ends.

At the end of the trial, we'll send you a link to complete the final survey. Remember if you do, you'll go into the draw to win one of five \$1,000 Prezzy vouchers ([terms and conditions apply](#)).

### We're here to help

If you need any help with this eco-driving trial, [get in touch with us](#).

Safe travels,  
The Linkt team

[Terms and conditions apply.](#)

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# APPENDIX 5

## Customer comments on trial

Participants provided insights in five key areas:



### GOFAR ecosystem

"I love the presence of the Ray—it is a prominent visual reminder of what the foot is doing"

"The Ray could be more sensitive with additional colours"

"App could be more user-friendly"

"Having the GOFAR Ray facing you is a constant reminder of taking a sensible approach to how you drive"



### Driving feedback

"Provide individual analysis of participant's driving habits and how to improve"

"More regular feedback on my driving"

"I'd like to know if my driving was improving"



### Eco-driving techniques

"More info about how to drive sustainably in peak-hour traffic"

"Tips about coasting in neutral and braking"

"More frequent emails would be good"

"More information on eco-driving techniques"

"Provide more information on website re eco-driving"



### Trial generally

"Provide more information about what is done with the data received"

"I thought the trial was well organised, good customer service"

"There wasn't much of a delay between receiving the kit and the education emails"



### Value of trial

"I think I have gone from being a terrible eco-driver to average and hopefully I will improve even more over time"

"Try to get more people to do it as I think it's great"

"This has made me drive better"