

The power of electric bikes

In 2015, RAC took electric bikes (e-Bikes) for a spin in a trial that successfully demonstrated they can enhance the attractiveness and convenience of cycling as a mode of transport for commuting.

We partnered with the City of Perth, City of Wanneroo, North Metropolitan Area Health Service through Queen Elizabeth II Medical Centre Trust and the University of Western Australia to run this 10-week trial of e-Bikes in Perth. It was also supported by the Departments of Transport and Sport and Recreation through the *Your Move* program.

What is an e-Bike?

An e-Bike, or power-assisted pedal cycle, is simply a bicycle with an electric motor and battery that provides assistance to the rider (up to a speed of 25km/hr), helping to take some of the effort out of cycling. There are two categories of e-Bikes in Western Australia, those with a maximum power output of 200 watts and "Pedalecs" which comply with the *European Standard EN 15194* and have a maximum power output of 250 watts.

These bikes are increasing in popularity around the world, with many people finding them a quick, convenient and easy way to get around.

The global e-Bike market has expanded dramatically and it has been estimated that global annual sales will increase from around 32 million in 2014 to over 40 million in 2023¹.

Why did we run this Trial?

Perth is growing at a rapid rate and our City's population is set to jump a further 1.5 million, to 3.5 million, within the next 35 years. Strong population growth brings its own challenges. By 2031, it's predicted that seven of the nation's 10 most congested roads will be in Perth and congestion will cost the State \$16 billion in lost productivity².

While there is no single solution to Perth's congestion challenge, an increase in cycling can help to reduce the number of cars on the road, as well as provide benefits for individuals.

With our wonderful climate and relatively flat landscape it is no surprise that many people enjoy cycling, for a variety of reasons. For some however, actual or perceived barriers such as distance, time, fitness or health constraints can make cycling less practical.

Cycling is booming with around 591,000 cyclists taking to WA's streets and paths every week³. That's much higher than the Australian average! We want to help make cycling a more convenient and realistic commuting option for even more Western Australians.

We launched the RAC e-Bike Trial to understand the potential of e-Bikes to overcome some of the barriers to cycling, through the eyes of the user.

What did the Trial involve?

The trial was launched on Friday 28 August 2015. Over 10 weeks, from Monday 31 August until Sunday 8 November 2015, 40 employees of the four participating workplaces (10 employees from each) had exclusive use of a SmartMotion eCity e-Bike for their commute to and from work, as well as any other trips they wished to make. Participants were asked to complete before and after surveys and report their usage and experiences through weekly travel diaries⁴.

To encourage any newly established travel behaviours to be maintained after the trial, participants were also given the opportunity to purchase their e-Bikes during Week 7 of the trial.

Safety induction

To help them feel more confident and safer when cycling, all participants received the following as part of their induction:

- > a practical demonstration of how to use their e-Bike;
- > bicycle skills and on-road cycling training;
- > safety equipment (e.g. high visibility vests and ankle straps);
- > an induction booklet setting out procedures and important information (e.g. road rules of relevance to cycling in WA); and
- > useful resources (e.g. personalised journey planning maps).

¹Global annual sales of e-Bicycles are expected to exceed 40 million units by 2032. Retrieved from <https://www.navigantresearch.com/newsroom/global-annual-sales-of-e-bicycles-are-expected-to-exceed-40-million-units-by-2032>.

²Infrastructure Australia (2015). Australian Infrastructure Audit Report.

³Australian Bicycle Council and Austroads (2015). National Cycling Participation Survey 2015. Western Australia.

⁴Note: One participant departed the trial during Week 1. All participants completed the "before" survey and their weekly travel diaries and 32 participants completed the "after" survey.

What were the key findings?

Over the 10 weeks, more than 1,700 e-Bike trips were made by participants - around 80 per cent of which were for commuting purposes. The most frequently stated "other" purposes were for leisure / fun (47 per cent of all other trips), for fitness / exercise (33 per cent) and to go to the shops (32 per cent).

 Significant behaviour change was experienced during the trial, with usage of e-Bikes for commuting remaining high throughout the 10-weeks.

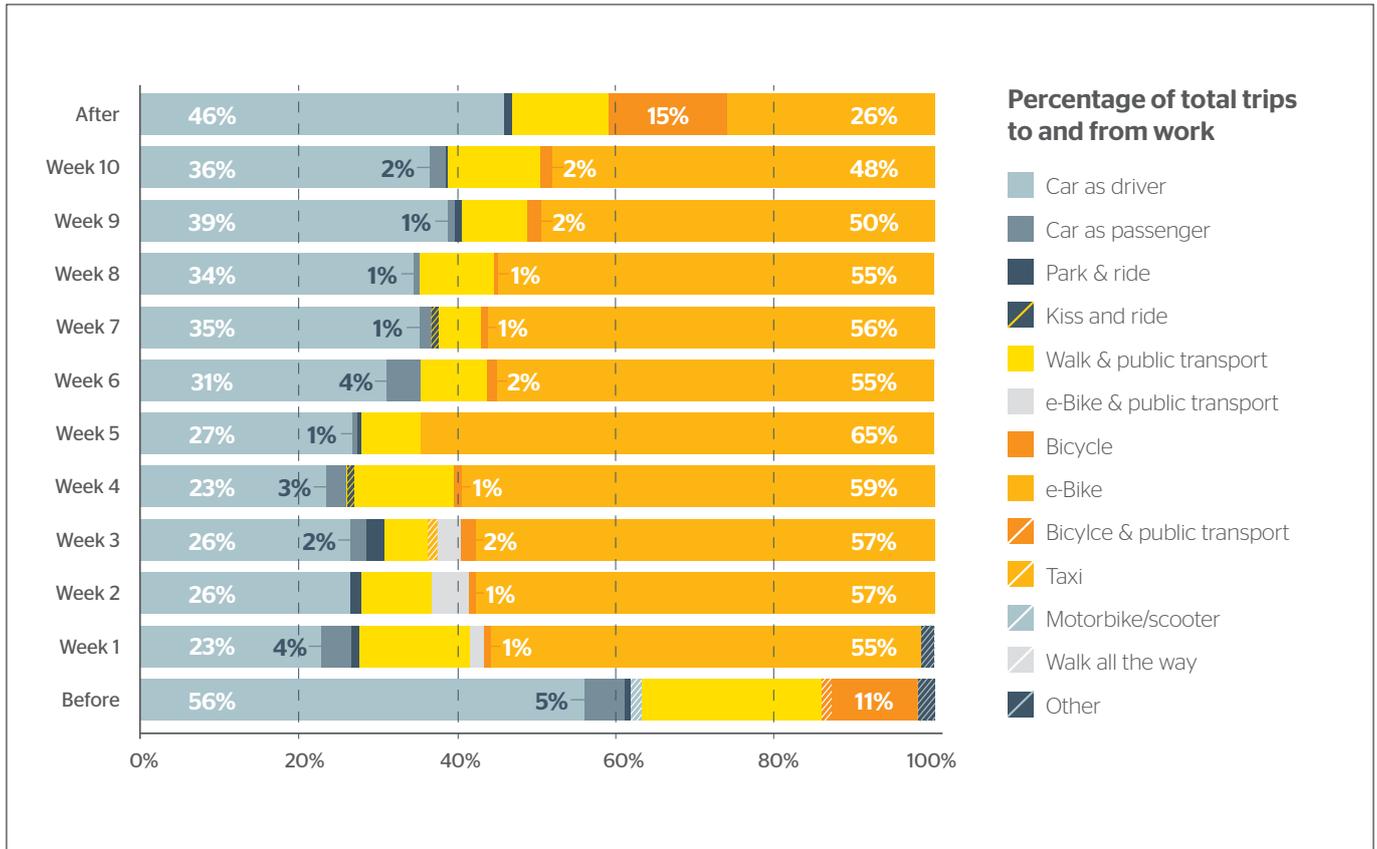


Figure 1 » Mode of travel for trips to and from work

Before the trial, a majority of the participant's commuting trips were made by car (61 per cent of all trips to and from work), this reduced to an average of 32 per cent during the trial. Over the 10-weeks, 55 per cent of commuting trips were solely made by e-Bike, with an additional 1 per cent by a combination of e-Bike and public transport, and 1 per cent by regular bicycle. This equates to a total of 57 per cent of commuting trips involving an e-Bike or bicycle for some portion of the journey, compared to 11 per cent before the trial.

While the proportion of commuting trips by car settled at 46 per cent following the trial, this still represents a 15 percentage point reduction compared to before the trial despite many participants no longer having access to an e-Bike. In addition, just over a quarter of commuting trips continued to be made by e-Bike (26 per cent) and a further 15 per cent by regular bicycle, maintaining a high cycling mode share of 41 per cent.





For those who purchased their e-Bike (17 participants), 37 per cent of their commuting trips were by car as a driver after the trial but 50 per cent continued to be made by e-Bike and 13 per cent by regular bike (63 per cent in total)!

With a majority of participants already owning a regular bicycle before the trial, but less than half cycling for any purpose at least once a week, the increase in cycling maintained during and after the trial is considered to demonstrate that e-Bikes can increase the attractiveness of cycling as a mode of transport.

When it comes to **sustained behaviour change**, a majority of participants that completed the after survey said they expected to continue cycling more often than they did before the trial (11 of which said they were extremely likely to) and over half said they were likely to drive less often (8 of which said they would drive a lot less).

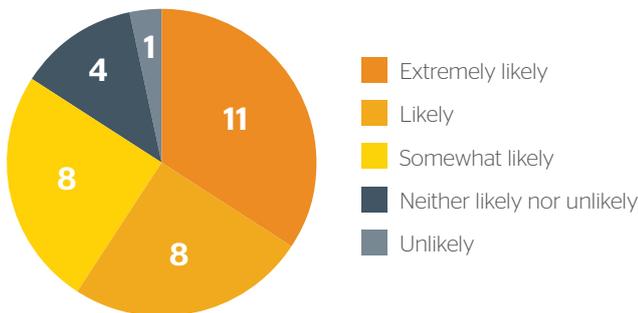


Figure 2 » Likelihood of cycling more than before the trial (number of participants)

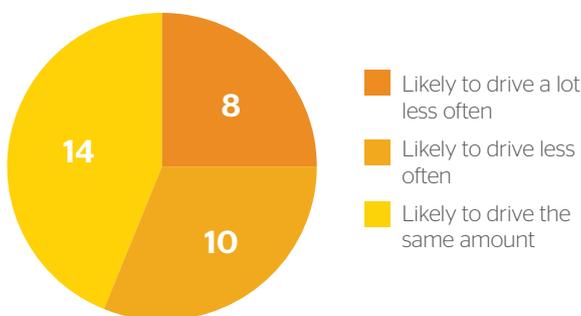


Figure 3 » Anticipated impact on driving frequency (number of participants)

The trial also demonstrated the **personal benefits of cycling** for transport:



24 out of 32 participants made financial savings totalling over \$1,600 per week.



23 experienced a range of health / wellbeing and / or fitness benefits (including feeling fitter and healthier, weight loss, feeling happier and less stressed and improved sleep quality).



7 reported saving a total of 7 hours per week commuting time.

When asked to rate their **degree of satisfaction** with their e-Bike experiences over the 10-weeks, all participants were satisfied, with just over half being extremely satisfied (17 out of 32), 12 being satisfied and three somewhat satisfied.

“I’m most definitely interested in purchasing my e-bike. I love it and can’t imagine life without it”
City of Perth participant.

In terms of what they liked most about the e-Bike, the freedom and enjoyment it provided was a common theme that emerged. Likewise, many said they liked the fact it offered a quick and easy way to get to work. The weight of this particular model was cited most frequently as the thing participants liked least about the e-Bike, and several also commented on difficulties replacing the rear tube due to the presence of the motor.

All things considered though, 31 of the 32 participants that completed the after survey said they would recommend e-Bikes to family, friends and / or colleagues as a commuting option.

88%

of the 944 respondents to a recent RAC poll said they would consider using an e-Bike to replace some journeys they currently make in their car, further demonstrating the appeal of e-Bikes.
RAC Member Poll, November 2015.

The participant’s experiences highlighted the importance of the Government investing in safe infrastructure (with a slight preference towards off-road infrastructure) and providing incentives / grants to encourage employers to retrofit workplace end-of-trip facilities, as well as providing road user education and training (including for novice e-Bike riders) to encourage and facilitate cycling.

In general, the feedback received from participants throughout and after the trial was very positive and from this it is apparent that many now have a newfound, or re-ignited, passion for cycling that will live on.

“It has renewed my love of cycling, and now it is the only way I will commute to work”
City of Perth participant.

“I have thoroughly enjoyed the 10 week bike trial and have found that even now the trial is finished, I am still getting up early in the morning to go for a scenic bike ride along the coast. I am a lot fitter and really enjoying the freedom you get on the e-Bike, not being limited by where you can travel by fitness”
UWA participant.

Moving forward

RAC believes the trial has provided encouraging evidence of the potential of e-Bikes to enhance the attractiveness and convenience of cycling as a mode of transport for commuting. The success of the trial is also testament to what can be achieved through effective partnerships delivering practical projects that put advocacy into action.

Following the trial, RAC has been investigating and progressing a number of legacy initiatives to keep the conversation going and maintain the momentum in promoting e-Bikes, and cycling more generally. These have included internal initiatives (such as our refreshed and expanded staff pool bike scheme and staff commuter e-Bike loan scheme) to demonstrate our continued commitment to helping RAC people to travel smarter and sponsorship of the “Switched on Bikes” campaign through the RAC Community Sponsorships program.

With e-Bikes proving to be a real alternative to the private car for some trips, consideration will need to be given to facilitating and encouraging usage, as well as managing the implications of increasing uptake. Safety, both for e-Bike riders and other road users, is a critical consideration.

Moving forward, RAC will continue to explore further opportunities to encourage and facilitate safe and responsible e-Bike usage, as a key to unlocking more demand for cycling.

Our next initiative will be the RAC Regional e-Bike Trial, which will be delivered with the support of the City of Albany and Department of Sport and Recreation. This trial will be launched on 30 September 2016 and will run for 10 weeks from Monday 3 October to Sunday 11 December.

“Switched on Bikes” Campaign

In March 2016, RAC sponsored the “Switched on Bikes” campaign, as part of the “Switch Your Thinking” initiative. “Switch Your Thinking” is an initiative of the City of Gosnells, City of Armadale and Shire of Serpentine-Jarrahdale, working together as the South East Regional Energy Group, to help communities and councils reduce their greenhouse gas emissions.

“Switched on Bikes” is a promotional, educational and community engagement campaign that aims to increase awareness and adoption of e-Bikes within Perth, helping to reduce emissions from transport and promote greater commuter choice. It involves promotional activities, e-Bike user and driver safety education, community events (including e-Bike conversion demonstrations) and an e-Bike trial at each participating council.

About the RAC

RAC works collaboratively with Government and other organisations to ensure our members and the community can move around our State safely, easily and in a more sustainable way.

We give back by reinvesting our profits for the benefit of our members through projects aligned to RAC’s Mobility Agenda, such as the RAC e-Bike Trial.

Supported by:



For more info please contact
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