



TRIAL SUMMARY

This trial sought to quantify the fuel efficiency benefits of ongoing environmental driver training, following a case study on the initial benefits of driver training in Phase 2 of the Green Truck Partnership.

The trial was conducted for one prime mover running an urban haul application in Melbourne. (A similar but separate case study was completed for rigid trucks.)

Immediate fuel efficiency benefit (2 months) (%)

Ongoing fuel efficiency benefit (10 months) (%)

8%↑  
(saving 4.63 L/100 km)

18%↑  
(saving 10.29 L/100 km)

↑ performance better than conventional vehicle  
↓ performance worse than conventional vehicle

The *Green Truck Partnership* is designed to be a forum for the objective evaluation of the merits of clean vehicle technologies and fuels used by heavy vehicle operators. This report discusses the results of an ongoing environmental driver training trial conducted under the program in 2013.

**1 ONGOING ENVIRONMENTAL DRIVER TRAINING**

Environmental driver training has the potential to reduce vehicle fuel consumption and wear and tear, in addition to its recognised safety benefits. The fuel efficiency elements of traditional driver training programs have been repackaged under the banner of environmental driving, which essentially covers the driver-controlled functions of operating a vehicle’s powertrain and support systems in a way that optimises fuel efficiency.

Under Phase 2 of the Green Truck Partnership in 2012, two trials were conducted that measured the impact of one-off driver training on the fuel efficiency of rigid and prime mover vehicles.

As seen in similar trials overseas, immediate fuel efficiency results were realised. On average, the trials saw a fuel efficiency benefit of 7% for rigid vehicles, and 8% for prime movers.

However, the published literature also shows that the long-term benefits of one-off training vary widely, and nearly always tend to drop off over longer periods of time. Therefore ongoing driver training is critical to ensure long-term changes in behaviour and fuel consumption benefits (driver commitment and company culture are also important).

A number of Australian driver training companies promoting improved driver practices report an immediate 5–20% reduction in fuel consumption, but the longer term reduction in fuel consumption through changes in driver behaviour still remains relatively undocumented.

**2 TRIAL OBJECTIVE**

The purpose of this trial was to assess the permanence of real-world economic and environmental improvements from driver training. These improvements were compared across two groups of drivers:

- Drivers that completed simulator and in-cab driver training in 2012, with no follow-up training.
- Drivers that completed simulator and in-cab driver training in 2012, but then received two additional sessions of in-cab training after 12 months.

### 3 METHODOLOGY

#### DATA COLLECTION

This particular trial involved an in-field assessment of one prime mover operating urban distribution routes in metropolitan Melbourne.

The driver was monitored for 12 months, with Phase 1 of the trial running between May and July 2012, and Phase 2 running between August 2012 and May 2013 (Table 1).

Table 1 Driver training overview

Training phase	Description	Drivers trained
<b>Phase 1</b> May–Jul 2012	Simulator training In-cab training	Driver 10
<b>Phase 2</b> Aug – May 2013	Monitoring	

The driver training focused on the following aspects of vehicle operation and behaviour.

- Route planning.
- Planning and observation.
- Gear shifting.
- Speed.
- Acceleration and cruise control.
- Steady braking.
- Idle time.
- Driver awareness and attitude.

During the trial period, data loggers were used to collect data from the vehicle to ensure fuel consumption comparisons were valid.

The data collected by the loggers included:

- **DISTANCE:** kilometres travelled.
- **IDLE TIME:** time spent at idle.
- **AVERAGE SPEED:** average speed (km/h).

Other datasets were collected but were not relevant to this particular trial.

During the trial period, fleet fuel records were used to capture fuel consumption data (as this could not be captured from the data loggers). The fuel data included:

- **FUEL CONSUMPTION:** total fuel (litres).

#### DATA ANALYSIS

The first stage of analysis (i.e. Phase 1) was covered in the published 2012 Green Truck Partnership case study *Environmental driver training – prime mover*. It focused on the fuel efficiency of the same prime mover driver who had undertaken simulator and in-cab training.

The data analysis undertaken in this case study focuses on the permanence of the fuel efficiency benefit over time.

Speed profile data was used as the key duty cycle descriptor to validate the average fuel consumption of the vehicles 'before' and 'after' driver training. The results of this comparison are discussed in Section 4.

Figures 1 and 2 show the monthly speed and fuel consumption profile data for the prime mover throughout the trial period. The speed profile shows a suitable level of fit across the monthly operation of the prime mover, ensuring the validity of ongoing fuel consumption comparisons following driver training.

#### 4 RESULTS

An overview of the fuel consumption results for the trial vehicle across the 12-month period is provided in Table 2 and Figure 2. In summary,

- An immediate fuel efficiency benefit was observed following initial driver training.
- The average fuel efficiency improvement increased and then plateaued over the 12-month period following initial driver training.

Following initial driver training (documented in the original Green Truck Partnership case study), the trial vehicle showed an average fuel efficiency improvement of 8% and an idle reduction of 91% after two months. The reduction in fuel use corresponds to a financial saving of \$6.48 per 100 km and an emissions reduction of 125 g CO<sub>2</sub>-e/km.

Monitoring of the prime mover driver continued over a 10-month period following the initial driver training. Monitoring showed an average fuel efficiency improvement of 18%, with a 92% reduction in engine idling. The fuel saving translated to an emissions reduction of 278 g CO<sub>2</sub>-e/km and financial savings of \$14.41 per 100 km.

A summary of the idle reduction results for the trial vehicle across the 12-month period is provided in Table 3.

The ongoing improvement, despite no further training, runs contrary to some results in other studies. However, it does not necessarily suggest an error, because it can be attributed to one or more factors including (but not limited to):

- A greater interest in environmental driving by the driver following initial training.

- The driver practising and improving driving technique over time.

#### 5 CONCLUSION

The findings of this trial suggest that environmental driver training for a driver operating an urban haul prime mover in metropolitan areas can achieve:

- an immediate improvement in fuel efficiency (in this case, it was approximately 8%) following initial driver training, relative to vehicle operation without training intervention;
- a substantial ongoing fuel saving (in this case it was an average of 18% over an additional 10 months), compared with the pre-training period.

International studies suggest that the typical trend followed by drivers who had undergone environmental training begins with an immediate fuel saving, followed by a decline in savings over time (as training practices are either forgotten, or original driving habits resume).

This trial shows that fuel efficiency can continue to improve over time even in the absence of follow-up training. However, as only one prime mover driver was involved in this case study, these results cannot be assumed to apply across the entire fleet or driver base.

Operators must also consider a whole-of-life economic analysis to weigh the potential fuel savings against the cost of the driver training, and any changes in vehicle repairs and maintenance.

**Table 2** Fuel consumption benefit after driving training intervention

Training model	Driver	Phase 1: Single simulator and in-cab training (May 2012)	
		Immediate fuel saving (2-month average)	Ongoing fuel saving (10-month average)
Phase 1 only	Driver 10	8%	18%

**Table 3** Idle performance after driver training intervention

Training model	Driver	Phase 1: Single simulator and in-cab training (May 2012)	
		Immediate idle reduction (2-month average)	Ongoing idle reduction (10-month average)
Phase 1 only	Driver 10	91%	92%

Figure 1  
 Monthly speed profile of Driver 10  
 for Phase 1 and 2 of the trial

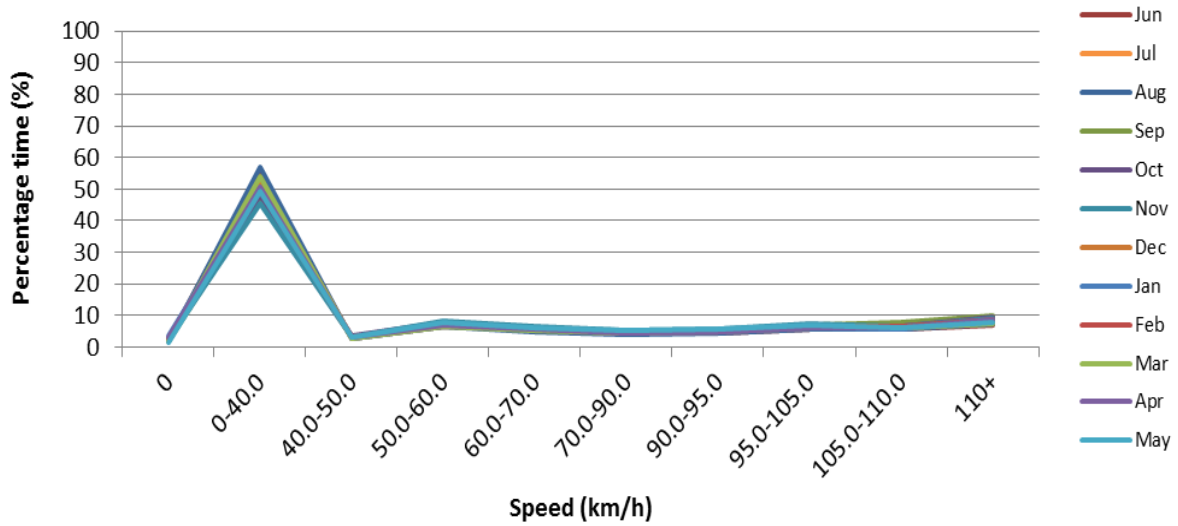


Figure 2  
 Average fuel consumption benefit following  
 driver training in Phase 1 of the trial

