



Clean Vehicles Partnership

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## Technical Note 9

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### Reducing Fuel Costs & Emissions by Improving Driver Performance



Prepared for Heathrow Airport Limited by  
Sustainable Transport Solutions (STS)



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# 1 Introduction

How vehicles are driven plays a big part in determining fleet operating costs and emissions. The emissions and fuel saving benefits of improving driver performance are proven. Better driving will also reduce vehicle wear and tear, reduce accidents and improve residual values.

The improved driving techniques of smoother acceleration and braking, good anticipation to reduce the need to brake and accelerate, appropriate use of gears and cutting down on idling are all applicable at Heathrow to most drivers, in most vehicles, most of the time. Consequently, improving driver performance should be seen as the 'low hanging fruit' when it comes to reducing fuel costs and emissions. With little or no investment required, it should be possible to begin targeting fuel cost reductions across the entire fleet immediately.

The purpose of this technical note is to:

- Highlight the process and tools for improving driver performance
- Set out the business case for targeting improvements in driver performance
- Summarise the results from a number of Heathrow trials using training and telematics to improve driver performance

## 2 Process and Tools for Maintaining Improved Driver Performance

The techniques to improve driver performance resulting in improved fuel economy and reduced vehicle wear and tear are relatively straight forward and simple to impart. Years of experience from Government eco-driver training programmes have shown that, on average, a driver can improve his/her fuel economy by 15% following instruction. Of course, every driver is different and some will achieve more savings than others. But, on average, any group of drivers can deliver a 15% saving in fuel costs as a result of being instructed in eco-driving techniques.

The fundamental challenge, however, is how does a business sustain better driver performance day-in, day-out throughout the year? There are four key areas to consider:

1. Monitoring
2. Communications
3. Training
4. Rewards

Of these monitoring and communications are absolutely essential. If there is no long term commitment to monitor driver performance and to communicate with drivers then very little will be achieved. Training and rewarding drivers are also desirable to achieve maximum impact.

## 2.1 Monitoring

Monitoring should be the starting point for any initiative aimed at improving driver performance. Broadly, there are two options:

- A manual approach of routinely collecting fuel use and mileage/hours data in order to calculate fuel economy rates
- Use of telematics to provide data on a range of key performance indicators such as mpg, harsh acceleration and braking and engine idle time. As well as providing mpg many telematics systems also report overall composite performance indicators that can be easily communicated to drivers e.g. in the form of league tables.

The decision on which approach to take will depend on a range of factors, e.g:

- How easy/difficult will it be to gather fuel use and mileage/hours data on a regular basis?
- What opportunities are there for a telematics system to deliver benefits in other areas such as fleet size, mileage and maintenance?

Once systems have been established for the routine capture of key data, it will then be possible to begin to manage fuel use proactively. For example it should be possible to:

- Cascade mpg and cost performance of each vehicle and/or driver to senior and line managers;
- Compare performance against certain benchmarks e.g. as a % of the manufacturer quoted figures (urban cycle) or a % of what was achieved by your vehicles over a previous time period;
- Generate exception reports containing those vehicles/drivers that underperform the benchmark.

## 2.2 Communications

All drivers should be made fully aware of any new initiative right from the start. Ideally there should be communication from senior management to explain what is going to happen, why and what the benefits will be.

Then, in order to maximise success there should be on-going, effective communications that ensure that:

- Drivers are made aware of business fuel costs
- Drivers are aware of any benchmarks/targets that have been set
- Drivers are aware of their performance and how it can be improved

Performance reports should be communicated and cascaded at least monthly and preferably weekly. The use of driver league tables is a particularly effective way of keeping the issue 'live' in drivers' minds.

In terms of progress made, information detailing the fuel performance of their vehicles / drivers should be disseminated to managers for onward communication to drivers. A key

indicator to report on is the pence per mile for each vehicle, and an average for each group of vehicles. Reports showing excessive pence per mile figures would allow managers to investigate the causes of excessive costs, which might be due to mechanical problems, poor driving, a flaw in the reporting process, driver dishonesty, or a combination of all four.

## **2.3 Training**

For drivers who appear regularly towards the bottom of league tables some form of training should be considered. This could be undertaken in house or by using a specialist driver training provider; ideally one that focuses on how to improve fuel economy.

For drivers of cars and vans the Energy Saving Trust run the Government subsidised 'Smarter Driver Training' which costs just £20 per driver. The training consists of two runs: the first is under instruction from the trainer and the second involves the driver putting some of the techniques into practice. The training takes place at the employer's site and takes just 50 minutes per driver, thereby minimising work downtime.

For drivers of heavier vehicles there is no equivalent Government programme. However there used to be a programme called SAFED (Safe and Fuel Efficient Driving) and there are a number of training providers that are SAFED accredited. The old SAFED website has been archived and can be viewed at the following address:

<http://webarchive.nationalarchives.gov.uk/20100515171941/http://safed.org.uk/>. There are list of SAFED accredited trainers for each vehicle type on this website. The SAFED type training offered by these trainers will vary but typically will cost in the region of £500 per day, during which up to 4 drivers can be trained (i.e. £125 per driver).

## **2.4 Rewards**

Nothing incentivises good practice more than the prospect of financial reward! Offering some form of reward for the best performing drivers should help to reduce resistance and show that the company is serious about the issue.

There are many different ways of setting up a reward scheme from more formal bonus schemes linked to targets to less formal periodic competitions. Possible schemes for incentivising fuel efficient driving include:

- set a fuel economy target for each driver and reward them if it's achieved.
- a team/company-wide bonus for everyone if the whole fleet meets a certain mpg target.
- offer a prize to the driver with the most improved mpg or league table standing over a month/quarter

### 3 Business Case

Developing a business case for investment in the process and tools for improving driver performance is a crucial first step. Sustainable long-term benefits will only be realised if the necessary investment and staff resources are committed. And the commitment to investment and staff resources requires a business case to be established.

A relatively simple business case can be developed based on estimates of fuel costs savings. However, it is important to recognise that many other financial benefits are likely to be gained from a well resourced initiative. Table 1 below highlights some of the main costs and benefits that should be considered.

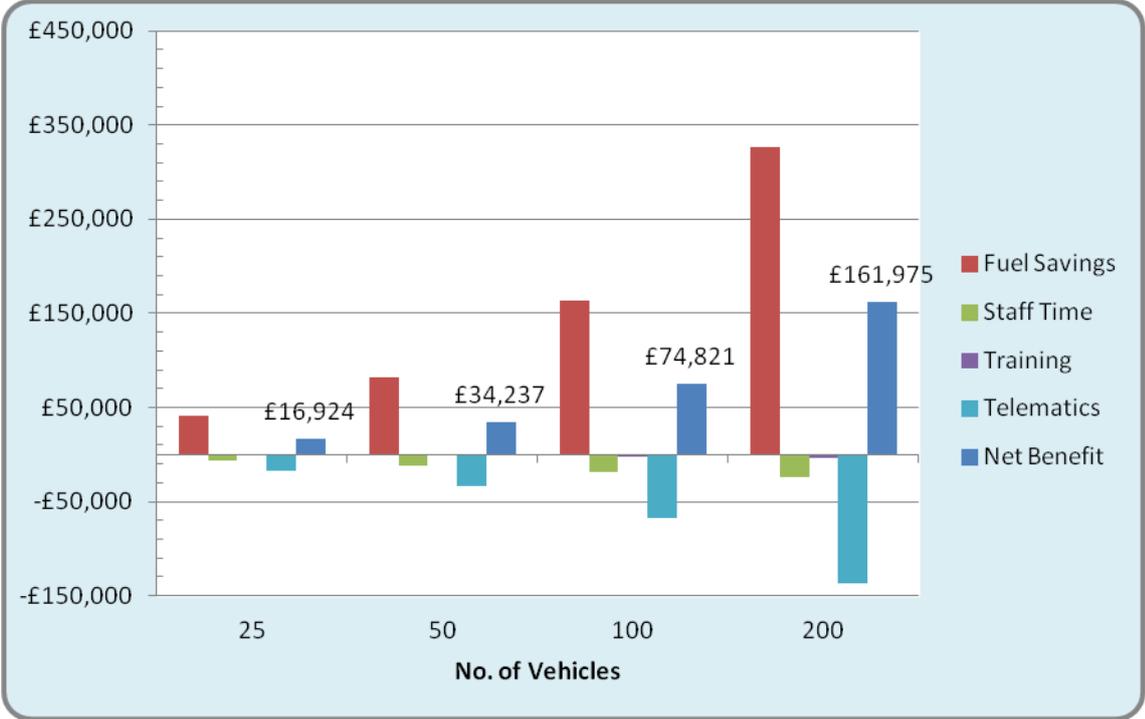
**Table 1 Costs and Benefits of Driver Performance Initiatives**

Costs	Benefits without Telematics	Benefits with Telematics
<b>Staff Time</b> (c. 1-8 days per month depending on fleet size and what monitoring tools are used)	<b>Fuel cost savings</b> (c. 10%)	<b>Fuel cost savings</b> (c. 15% if telematics has in-cab feedback)
<b>Training</b> (£20 per car and van driver, £125 per HGV/Bus driver)	<b>Reduced vehicle ware and tare</b> (Difficult to quantify but a real saving – Lightfoot are doing research on this)	<b>Other benefits gained from use of telematics</b> (reduced mileage, reduced fleet size, reduced maintenance costs, etc)
<b>Telematics</b> (Costs highly variable dependent on system)	<b>Reduced insurance premiums</b>	<b>Reduced vehicle ware and tare</b>
	<b>Increased residual values</b>	<b>Reduced insurance premiums</b>
		<b>Increased residual values</b>

The table highlights a wide range of factors that can influence the net benefit of a driver performance improvement initiative. Furthermore, for many of these factors it is difficult to accurately assign a value. Nevertheless, it should be possible to carry out a simple cost-benefit analysis comparing fuel cost savings against staff, driver training and telematics costs.

Figure 1 below shows the net benefits for 4 different flee sizes (25, 50, 100 and 250 vehicles) over 3 years using white diesel and investing in telematics.

**Figure 1 Driver Performance Improvement Net Benefit Over 3 Years – Diesel + Telematics**



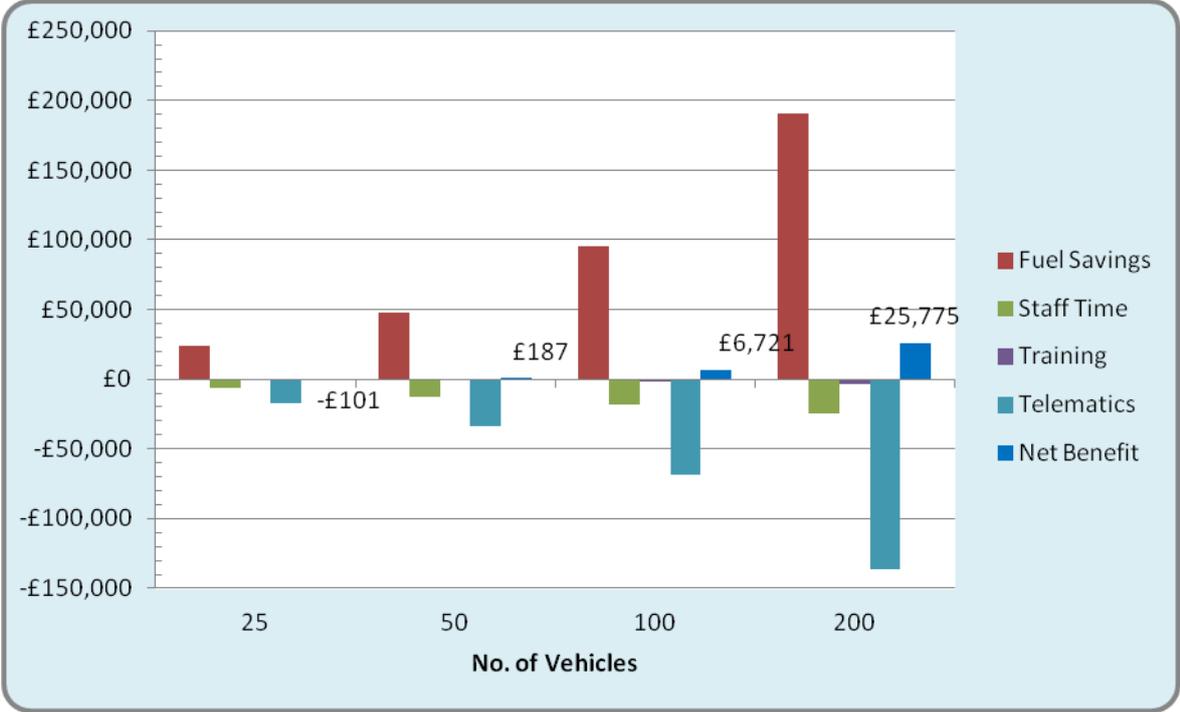
**Assumptions:**

- *Fuel savings:* 15% reduction, fleet average mpg = 18, 12,000 miles/vehicle, fuel price (net of VAT) = £1.2
- *Staff Time:* 1 to 4 days per month depending on fleet size; salary plus on costs of £45,000
- *Training:* c. 10% drivers trained per year. £20/car & van driver, £125 per HGV/Bus driver
- *Telematics:* Hardware = £250/vehicle, Data = £12/vehicle/month

Figure 1 illustrates that, given the above assumptions, a net benefit should be achievable for all fleet sizes. It is also very important to note that the above analysis has included all cost elements but not all benefits. So in this case the net benefit should be seen as the minimum with greater benefit likely to result from other reduced vehicle costs and using other functionality on the telematics system.

Many fleet operations at Heathrow use cheaper red diesel which will have a significant impact on the analysis above in terms of a reduction in the fuel saving benefits. Figure 2 below shows the same analysis but for red diesel with the price at just £0.7/litre net of VAT.

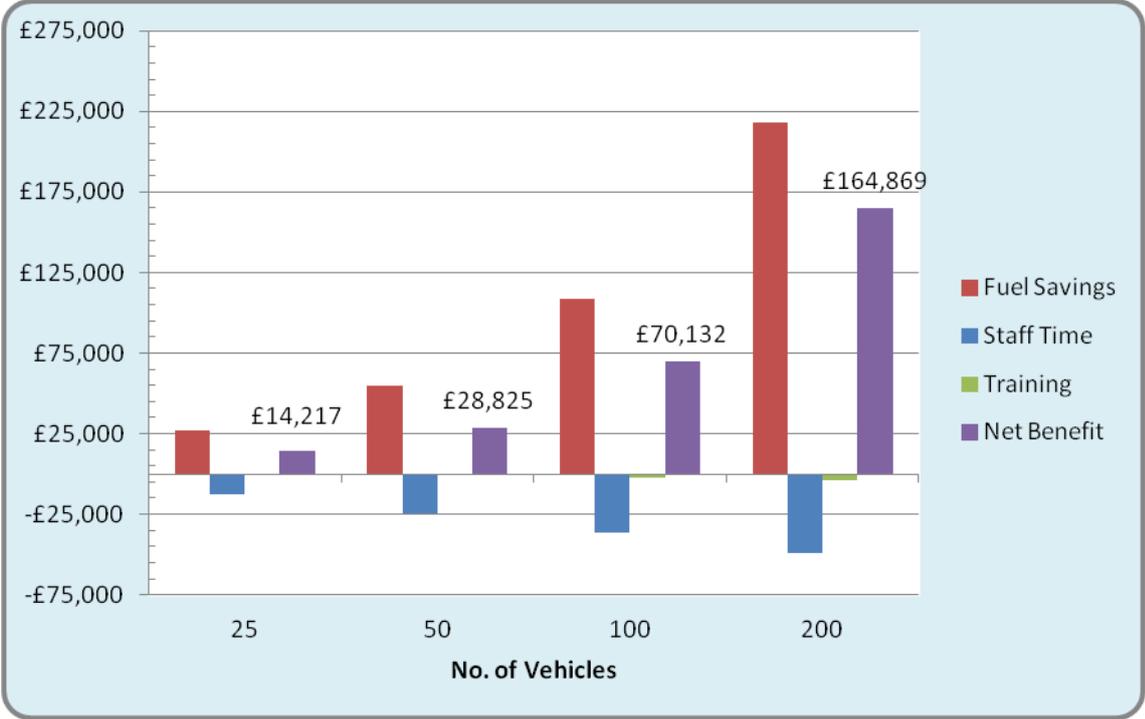
**Figure 2 Driver Performance Improvement Net Benefit Over 3 Years – Red Diesel + Telematics**



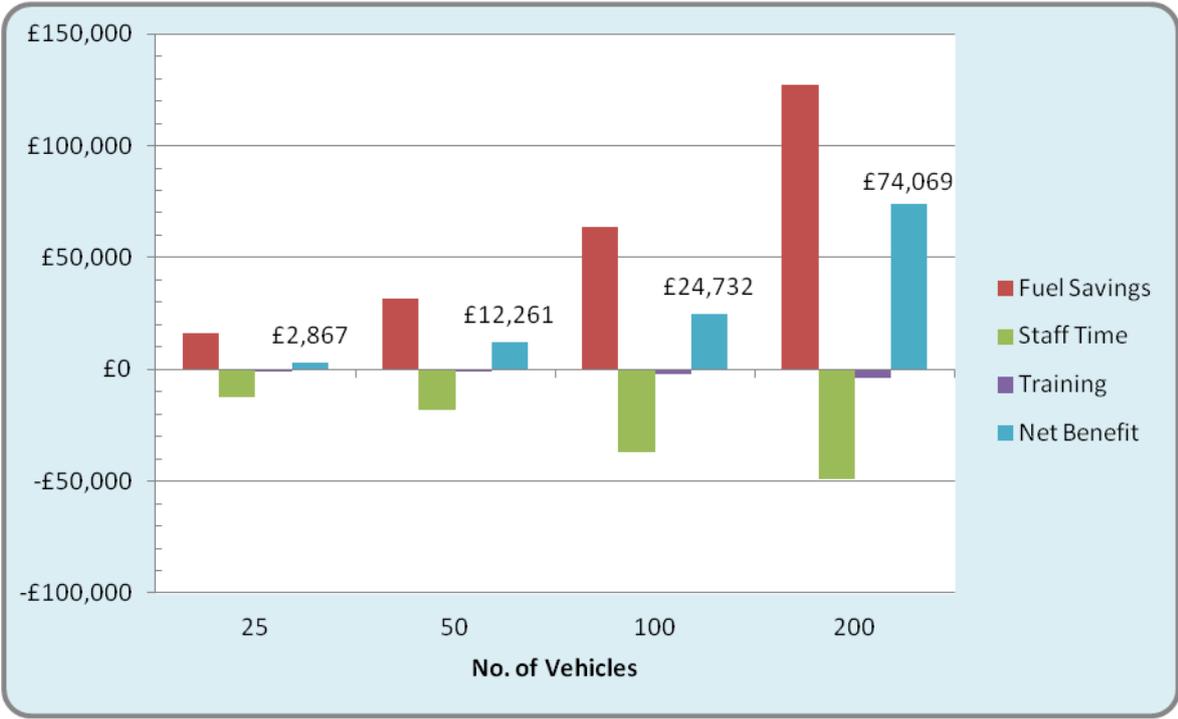
With red diesel the business case is much less certain with a small negative net benefit for smaller fleet sizes of around 25 vehicles. Larger fleets still show a positive net benefit and, again, it’s important to recognise the wider benefits that should be achieved through better driving and from the use of telematics.

The most expensive cost element in the analysis above is the telematics. For some fleets telematics may not make sense if the wider benefits of improving asset utilisation, reducing mileage, etc are unlikely to be realised. Figure 3 below shows the cost benefit analysis for fleets that don’t use telematics. It is assumed that fuel savings will be lower (10%) as there will be no in cab feedback and fewer performance indicators available to managers to feedback to drivers. In this analysis staff time to manage the process is increased as more effort may be required to collect and communicate mpg data.

**Figure 3 Driver Performance Improvement Net Benefit Over 3 Years – Diesel without Telematics**



**Figure 4 Driver Performance Improvement Net Benefit Over 3 Years – Red Diesel without Telematics**



All of the above analysis indicates that a programme of monitoring, feedback to drivers and targeted training should deliver a net benefit for all fleet sizes whether they are running on white or red diesel.

## 4 Heathrow Driver Training & Telematics Trials

During 2012 and 2013 the CVP funded a number of trials to demonstrate the impact of driver training and telematics on driver behaviour. The sections below summarise the key findings from these trials.

### 4.1 Driver Training Trials

In 2012 the [Energy Saving Trust's Smarter Driving](#) was piloted at 2 Heathrow based companies: Alpha LSG Sky Chefs and PIMS Group. The training was aimed at drivers of cars and vans (up to 3.5t). The training consists of two runs: the first is under instruction from the trainer and the second involves the driver putting some of the techniques into practice. This adds up to 50 minutes of on road tuition for each driver.

In total 20 drivers were trained across the 2 companies. The average improvement in mpg across all 20 drivers was 19.4%. Martin Sole from PIMS Group provided the following feedback about the training:

*"The training was set up as a trial for various roles within the company from sales staff to operational workforce. It was staggering to see the potential efficiency savings that this training could give and for such a small outlay. Other 'soft benefits' were also apparent including workforce engagement, safety and long term vehicle maintenance savings. The company intends to arrange some more training sessions in the near future."*

In October 2013 PIMS group did arrange some more Smarter Driving training with a further 8 drivers. The average improvement in MPG recorded for this group was 7%, significantly less than for the previous group, but still a potentially very significant saving. Commenting on these results Martin noted that the drivers were sales staff rather than van drivers and that there was a high degree of competition between them to see who could score best. He added *'The team enjoyed the session and found some useful points'*.

#### **For more information about these trials contact:**

- PIMS Group: Martin Sole - [Martin.Sole@pimgroup.co.uk](mailto:Martin.Sole@pimgroup.co.uk)
- Alpha LSG Sky Chefs: Karl Roberts - [Karl.Roberts@alphalsg.co.uk](mailto:Karl.Roberts@alphalsg.co.uk)
- Energy Saving Trust (Smarter Driving Provider):  
<http://www.energysavingtrust.org.uk/Organisations/Transport/Products-and-services/Smarter-Driving>

### 4.2 Telematics Trials

There are numerous telematics products available with varying ranges of functionality. Most products offer modules that enable vehicle and driver performance to be monitored in real time as well as the more traditional service of 'track and trace' most often associated with telematics. There are also products that focus just on driver performance.

During 2012 and 2013 the CVP supported trials with a range of different telematics products described below.

**4.2.1 Lightfoot Trial with Heathrow Campus Security**

[Lightfoot](#) is an in cab dashboard display providing real-time feedback on driver behaviour supported by off-line driver performance reports. The product focuses on providing simple, useful information about driver behaviour. Ashwoods, the Lightfoot supplier, describe it as like having a driver trainer in the vehicle every second it’s on the road. It encourages drivers in real-time to drive in the most efficient way possible and makes sure they do not slip back into bad habits. The improvements in driver efficiency are immediate and sustained.

The Lightfoot system was installed on 5 Ford Transits operated by the Heathrow Campus Security team for an 8 week trial. Five weeks were run blind – i.e. the units were fitted and transmitting data back to Ashwoods but there was no in cab feedback. The units were then switched to live with the in cab visual and audio warning functions enabled. Figure 5 below provides an example of a weekly report on the 5 vehicles during the blind phase. It shows the percentage of time each vehicle spends in green, amber and red efficiency bands as well as the number of violations. A violation is received after two audible warnings for inefficient driving.

**Figure 5 Lightfoot Trial Blind Phase**

Vehicle Registration	Time in Green	Time in Amber	Time in Red	Violations	Average Violations Per Day	MPG	Mileage	Lightfoot Rank
BG10BFZ	57%	40%	3%	3315	95	23.8	3147	5
CV61ZHJ	62%	34%	4%	2770	66	19.3	2994	3
CV61ZKB	66%	31%	3%	2179	62	21.5	2992	1
CV61ZHZ	66%	31%	3%	2249	54	22.5	3396	2
MU59YVU	59%	38%	3%	1929	80	21.8	1802	4

Figure 6 shows the final results of the trial with a comparison between the blind and live phases for each of the 5 vehicles. For all vehicles there was a huge improvement in driver performance with the number of violations per day being almost totally eliminated. Consequently, the average improvement in mpg was 11.2%. This result was in line with the results being achieved by other companies using Lightfoot, although some companies have seen mpg improvements as high as 23%

**Figure 6 Lightfoot Trial Live Versus Blind Phase**

Vehicle Registration	Time In Green	Time In Amber	Time in Red	Average Violations Per Day	MPG (%)
BG10BFZ	+29%	-27%	-2%	-94 (-98.9%)	+14.9%
CV61ZHJ	+24%	-22%	-2%	-61 (-92.4%)	+9.9%
CV61ZKB	+25%	-22%	-3%	-61 (+98.4%)	+15.5%
CV61ZHZ	+21%	-19%	-2%	-52 (-96.3%)	+7.7%
MU59YVU	+28%	-26%	-2%	-80 (-100.0%)	+11.7%

Table 2 below shows the costs and benefits of this trail scaled up to a 3 year period. Assuming 15,000 miles for a Ford Transit the per vehicle fuel savings are £1,087 over 3 years. With the cost of the unit and monthly data costs total net savings per vehicle would be £405.

**Table 2 Costs and Benefits of Lightfoot Trial over 3 Years**

No. of Vehicles	Fuel Savings	Investment	Net Savings
1	£1,087	£682	£405
25	£27,173	£17,050	£10,123
100	£108,694	£68,200	£40,494

Assumptions:

- Fuel savings: 15,000 miles, £1.15/l (net), 21.8 mpg, **11.2% saving**
- Investment: £250/vehicle for hardware, £12/vehicle/mnth data

It's important to remember that the benefits in table 2 are just from fuel savings and that, as highlighted in section 3 above, that there are other potential benefits which were impossible to try and quantify in this trial.

Following the trial 14 van drivers from the Heathrow Campus security team undertook the EST Smarter Driving. Their results showed an average improvement in mpg of 8%. This lower improvement result (compared to the 19.4% achieved by van drivers from the PIMS group and Alpha LSG Shy Chefs) indicates a possible sustained improvement from the Lightfoot trial. But of course the best way to sustain the improvement would be to use the system permanently.

**For more information about this trial contact:**

- Heathrow Campus Security: Rob Green - [Robert-LHR.Green@heathrow.com](mailto:Robert-LHR.Green@heathrow.com)
- Ashwoods (Lightfoot supplier): - <http://www.ashwoodslightfoot.co.uk/>  
- Martin Kadhim - [Martin.Kadhim@Ashwoods.org](mailto:Martin.Kadhim@Ashwoods.org)

## 4.2.2 Microlise Trial with LSG Sky Chefs

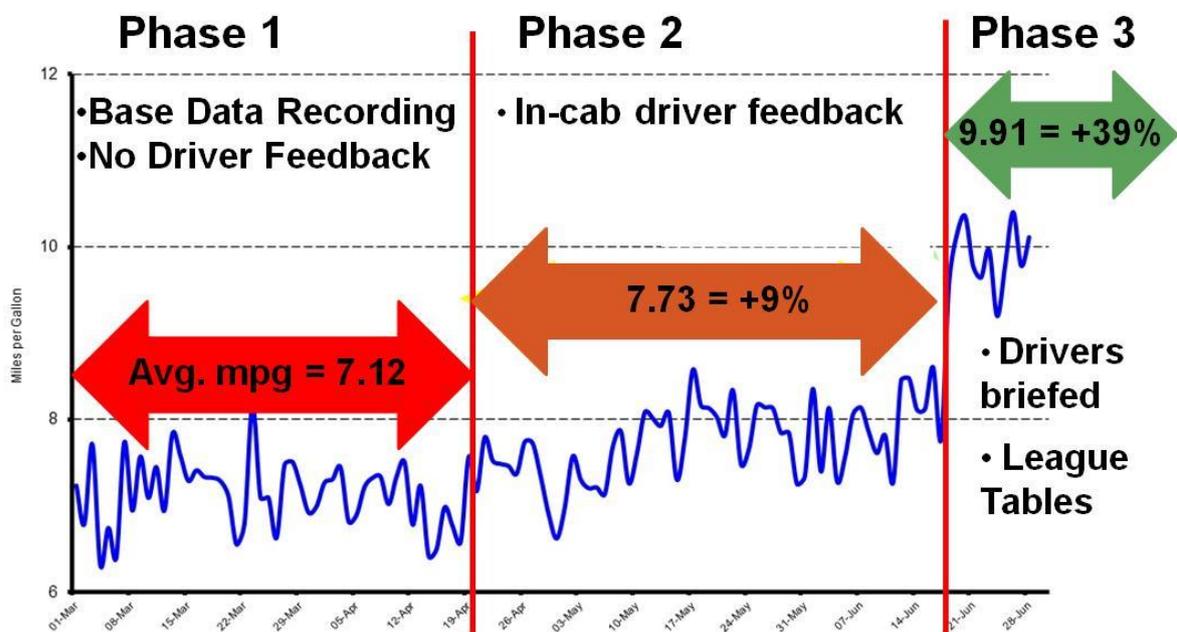
This trial was run by [F16 Consulting](#) with LSG Sky Chefs in 2011 who have kindly agreed to share their results with the CVP. A [Microlise](#) tracking system, which included a driver performance module was fitted to 4 LSG Sky Chef trucks.

The trial was run over several weeks in 3 phases:

- Phase 1 was run completely blind, with drivers unaware that the systems had been fitted, in order to collect base data;
- During Phase 2 the in cab driver feedback was enabled so drivers became aware that they were being monitored
- Phase 3 saw the introduction of driver briefings and league tables

The impact on mpg over the 3 phases is shown in Figure 7 below.

Figure 7 LSG Skychefs Microlise Trial Results



The impressive results from this trial can be attributed to two important factors:

- A very proactive fleet manager who briefed drivers and used the driver league tables generated by the Microlise system.
- A massive reduction in idling time on all 4 vehicles which was reduced by more than 90%

### For more information about this trial contact:

- Alpha LSG Sky Chefs: Karl Roberts - [Karl.Roberts@alphalsg.co.uk](mailto:Karl.Roberts@alphalsg.co.uk)
- F16 Consulting (Telematics consultant & broker): <http://www.f16consulting.co.uk/>  
- Antony Pennington - [antony@f16consulting.co.uk](mailto:antony@f16consulting.co.uk)