

## Fuel Saving in a Scottish Haulage Fleet

Case Study



**Companies Involved:** John Mitchell (Grangemouth) Ltd



**The Scottish  
Government**

*Department for*  
**Transport**

# Acknowledgements

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## Introduction

This case study profiles John Mitchell (Grangemouth) Ltd's investment in driver training, anti-idling policy and aerodynamics specification in its bid to reduce the running costs of its fleet. It lists actual cost and CO<sub>2</sub> reductions showing that real savings are achievable, and where Freight Best Practice Scotland can help you to achieve the same with your fleet. Look for signposts throughout the document to supporting Freight Best Practice publications.

## Foreword

John Mitchell started the business in 1956 with one vehicle operating from Grangemouth in central Scotland. The business expanded over the years and, in 1973, moved to a purpose-built, 3-acre haulage depot with new offices, workshop and storage facilities at Earls Road in Grangemouth. The Company is still family-owned and managed by Managing Director Iain Mitchell – the son of founder John Mitchell.

The haulage operation is still based at Earls Road, and a further seven acres of adjacent land was purchased recently for container storage. The haulage fleet also expanded over the years and now stands at 105 tractor units and 220 trailers, with an estimated 7 million miles covered annually, and 145 employees including administration, workshop and drivers.

Vehicles from MAN dominate the fleet with a handful of Mercedes making up the rest, all vehicles being leased on a 5-year repair and maintenance contract from local dealerships. The haulage workload at John Mitchell (Grangemouth) Ltd is split with about 50% containers servicing the nearby Grangemouth docks, 35%

curtain-side work on general haulage and distribution with the remaining 15% on powder tanker work.

Most drivers work on a shift system with about 40% of drivers expected to stay out overnight on tramping work. Only one vehicle is double-shifted and drivers are generally expected to keep the same vehicle every day.

The sectors in which the company currently operates are:

- ➔ Road Haulage – Specialising in containers, chemicals and timber
- ➔ Storage – General warehousing, container storage and specialist handling

This case study details three areas that John Mitchell (Grangemouth) Ltd has concentrated on in a bid to improve efficiency through improving MPG and reducing



# Driver Training

## SAFED

The Safe and Fuel Efficient Driving (SAFED) (or equivalent) programme is aimed at improving the safe and fuel efficient driving techniques of heavy goods vehicle (HGV) drivers. It has been developed specifically to enable both vehicle operators and training providers to implement driver training and development for existing HGV drivers within the road freight industry.

Since its introduction, thousands of drivers have been through the one-day training course, and hundreds of Driver-trainers have completed the SAFED Instructors' Course (or equivalent). Widespread benefits have been reported following the completion of training.

## Using Driver Training

John Mitchell (Grangemouth) Ltd started investing in SAFED equivalent training in 2007. Their programme is self-funded and undertaken as part of continuing investment into driver training and efficiency measures. The company now has its own Driver-trainer who has been on MAN Trucks' own familiarisation course at Sandbach. All of the fleet's 100+ drivers and some subcontractors have been trained by the qualified examiner.

Drivers are taken over one of two set routes which involve a mixture of urban streets, A roads, dual carriageways and motorways. Over the fixed routes drivers are encouraged to drive 'normally'. The instructor monitors the vehicle's telematics which records journey time, number of gear changes and fuel consumption. The instructor then demonstrates some of the basics of SAFED including:

- ➔ Clutch control
- ➔ Cruise control
- ➔ Exhaust brake
- ➔ Forward planning
- ➔ Gear selection

Drivers are then taken on a 'second run' along the test route and again gear changes and fuel consumption plus general driving behaviour are monitored.

## Sample Results of Driver Training

Fifteen drivers were given a fully-loaded test trailer on one of the routes:

- ➔ The drivers improved their fuel consumption by an average of 7% over the two runs on the same route using the same vehicle and trailer (as detailed in Table 1)
- ➔ Gear changes on manual vehicles reduced by 42% on average (as shown in Table 1). One driver reduced his total number from over 110 to 53 with no significant addition to journey time

Table 1 Sample results of driver training Table 1 Sample results of driver training

	Before training	After training	Saving
Milage	14.6	14.6	-
Gallons Used	2.22	2.07	7%
MPG	6.58	7.05	7%
Number of gear changes	60	35	42%

Drivers of automatic vehicles also saw an improvement in fuel consumption through better use of the vehicle's controls and a more sympathetic driving style. This corresponded to over a 7% improvement in overall fuel consumption with no significant rise in journey time.

### Driver Perspective

"It's always good to learn something new. I've been on the road for years but I found it useful. My truck's automatic, but you can still put the training into practice."

**Robert Moore, Driver, John Mitchell (Grangemouth) Ltd**

## Financial Gains

The fleet covers approximately 7,000,000 miles per year at 6.5 mpg on 44-tonne operations. With the investment in a Driver-trainer and a fuel saving of 7% the first year reduction in the annual fuel bill is detailed in Table 2.

Table 2 Savings achieved through driver training

	Before training	After training	Saving
Milage per year	7,000,000	7,000,000	-
MPG	6.5	7.0	7%
Gallons per year	1,076,923	1,001,538	7%
Liters per year	4,895,692	4,553,081	7%
Annual cost (based on £0.80 / litre)	£3,916,554	£3,642,465	£274,089
CO <sub>2</sub> (at 2.63kg / litre [Defra])	12,876t	11,975t	7%

A continuing programme of driver training should see fuel savings maintained across the fleet with additional financial benefits recorded by the company including:

- ➔ Reduced maintenance costs
- ➔ Reduced wear on driveline, brakes and tyres
- ➔ Reduction in vehicle downtime
- ➔ Reduction in accident damage

## Operator Perspective

“Drivers are responsive to the training; the lads pick it right up and are keen to improve.”

**Craig Simpson, Driver-trainer, John Mitchell (Grangemouth) Ltd**

“We have noticed a reduction in accidents since our SAFED equivalent training. Fuel consumption has improved too.”

**Iain Mitchell, Managing Director, John Mitchell (Grangemouth) Ltd**

Typically drivers would come into the yard, start their truck to warm up the cab and engine before conducting vehicle checks and perhaps get a coffee before their shift started. Drivers were encouraged to use their night heater instead of running their engines in the yard or when waiting for delivery and collections. Onboard telematics allows the traffic office to monitor vehicle operation, showing engine running time and other functions.

By implementing an anti-idling campaign through driver briefings, and memos handed out to drivers with their payslips it managed to significantly reduce wasted fuel across the 100+ vehicle fleet. These measures resulted in a drop in idling time of over 50%, with it now only accounting for 7% of all standing time.

## Anti-idling

Excessive idling of HGV engines is a waste of fuel and money. With modern vehicles, the cost of switching off the engine and starting up again is usually less than the cost of leaving the engine idling.

By following simple anti-idling advice, HGV operators can save money by reducing fuel consumption and exhaust emissions. The efficiency benefits of truck

anti-idling can be clearly demonstrated by examining commercial applications, as the following information demonstrates.

### Introducing the Anti-idling Campaign

Prior to implementing its anti-idling campaign John Mitchell (Grangemouth) Ltd used the onboard telematics to monitor idling time of the vehicles. It was found that idling accounted for 15% of a vehicle's daily stationary time.

## Financial Gains

Table 3 Savings achieved through anti-idling policy

Weekly saving	£700
Weeks	50
Cost saving	£35,000
Litres (based on £0.80 / litre)	43,750
CO <sub>2</sub> (at 2.63kg / litre [Defra])	115t

The 50% reduction in idling time for the whole fleet resulted in a £700 per week drop in diesel use (as detailed in Table 3). Night heaters are standard on the high specification vehicles and drivers are encouraged to use them instead of running the engine during cold weather. Driver and vehicle idling times are continuously monitored to ensure that staff do not slip back in bad habits.



## Driver Perspective

“It can be a cold start these mornings but we all have night heaters so there’s no excuse really.”

**Robert Moore, Driver, John Mitchell (Grangemouth) Ltd**

## Operator Perspective

“The drivers weren’t keen on the change but when we told them about the financial saving it soon struck home.”

**Iain Mitchell, Managing Director, John Mitchell (Grangemouth) Ltd**



# Aerodynamics

When a vehicle moves, the air exerts a force on the vehicle that opposes its motion. This force is the aerodynamic drag, and it has a significant effect on the fuel consumption of vehicles.

Drag is affected by vehicle shape, frontal area and speed. The greater the frontal area of a vehicle, the greater the aerodynamic drag will be. Similarly, the higher the vehicle speed, the greater the aerodynamic drag will be.

The aerodynamic styling fitted to trucks is to reduce aerodynamic drag, reducing fuel consumption and therefore costs. When specifying a new vehicle it is important to consider aerodynamics as an option. There is also a range of add-on features to retrofit existing vehicles to improve their aerodynamics.

Contribution of Aerodynamic Styling to Reducing Drag

Approximately half of the energy used by a truck travelling at 50 mph is needed simply to move through the air around the truck. At 60 mph, about two-thirds of the energy is used to cut through the air.

The potential for fuel savings through improved aerodynamic styling is obviously greatest in cases where a vehicle is most affected by one of the three key pointers to aerodynamic drag:

- High-speed travel
- Large vehicle frontal area
- Poor initial aerodynamic design

Savings of up to 13% in fuel bills can be achieved by the simple investment in an aerodynamics package. The investment is estimated to payback in a little over one year.



The varied size and shape of the trailers towed by the fleet ensures that good all-round aerodynamic design is required. High roof cabs work well with container and curtain-sided haulage, with trailers up to 14' 6" high. While smaller-cabbed vehicles are specified for use with bulk tanker and local applications, their lower height works well with tankers up to 12' 6" high. All tractor units are specified with full aerodynamic packages at a cost of £750.

By varying the angle of the roof fairing when pulling different trailers drivers can adapt their vehicles to reduce drag. Previous examples of aerodynamic investment show that a simple roof fairing can cost as little as £300 to retrofit and can payback the investment from fuel saving in less than 6 months. Over the lifetime of an articulated tractor unit this can significantly contribute to lowering fuel bills.

## Financial Gains

John Mitchell (Grangemouth) Ltd has been at the forefront of investing in aerodynamic packages for its vehicles. Cab roof deflectors, side-edge turning vanes, front bumper air dams and cab side-edge fairing for tractor units are all commonplace on the fleet, and have been since the technology entered the road haulage industry.

- ➔ For a modern fleet of 100 vehicles covering 7 million miles per year with an annual fuel bill of over £4.5 million the £750 extra invested at the start of the vehicle's life is estimated to have contributed to savings in the total fleet fuel costs by up to 9% (as detailed in Table 4)
- ➔ With payback for the investment in each vehicle within the first year of the truck's life, the five-year lifespan of the vehicle means this fuel saving contributes to lower running costs

## Operator Perspective

"Modern trucks come with an excellent aero-package as standard, we don't specify anything out of the normal from the manufacturer."

"We've not had a 'naked' truck in the fleet for years. My Dad (John Mitchell) saw the benefit of aerodynamics long before the rest and took advantage of early air dams straight away."

**Iain Mitchell, Managing Director,  
John Mitchell (Grangemouth) Ltd**

## Estimated Financial Gains

Table 4 Estimation of savings achieved through aerodynamics specification

	With aerodynamic specification	With aerodynamic specification	Saving
Milage per year	7,000,000	7,000,000	—
MPG	5.96 (est)	6.5	9%
Gallons	1,174,496	1,076,923	9%
Liters	5,339,262	4,895,692	9%
Cost (based on £0.80 / litre)	£4,271,410	£3,916,554	£354,856 (est.)
CO <sub>2</sub> (at 2.63kg / litre [Defra])	14,042t	12,876t	9%



# Conclusions & Recommendations

Table 5 A summary of savings achieved through John Mitchell (Grangemouth) Ltd’s fuel-saving fleet-wide interventions

	Cost / Outlay £	Litres of diesel saved per annum	Average % improvement in MPG	CO <sub>2</sub> Savings per annum	Cost Saving
SAFED Equivalent Driver Instruction	On the job instruction plus Driver-trainer time	342,698	7%	901t	£274,159
Anti-Idling Campaign	Driver Briefing and Memo	43,750	-	115t	£35,000
Aerodynamics Investment	£75,000 (£750 per vehicle)	443,570 (est.)	9% (est.)	1,166t (est.)	£354,856 (est.)
TOTALS	£100,000 (less than £1,000 per vehicle / driver)	830,018	-	2,182t	£664,015

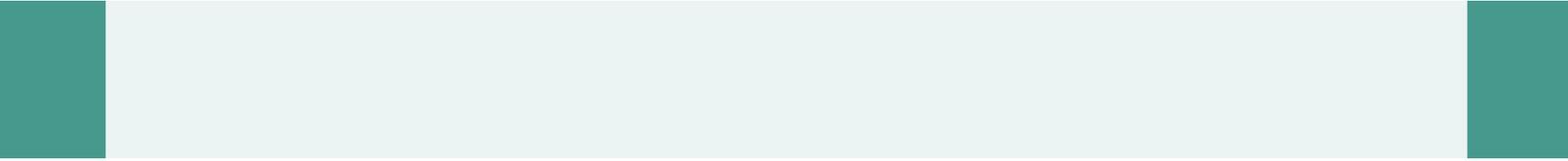
## Conclusions

- ➔ Investment in your staff and equipment can be paid back in a short period of time and can then continue to serve your company well through lower running costs and increased employee job satisfaction
- ➔ This case study has shown that not only your bottom line can improve, but also have a beneficial reduction in your CO<sub>2</sub> and other emissions

John Mitchell (Grangemouth) Ltd has proved that by carefully investigating elements of operating heavy goods vehicles it has established operating procedures, training schedules and a procurement policy which best serves to benefit the company long into the future.

## Recommendations

- ➔ Savings through the initiatives such as those seen in this case study are entirely achievable through identifying which parts of your business could benefit the most from intervention
- ➔ These measures have required investment (either in time or money) to realise their savings, but the payback has been significant
- ➔ This case study shows that real savings are achievable, and where the Freight Best Practice Scotland programme can help you to achieve this
- ➔ Use your fuel and CO<sub>2</sub> savings to market your green credentials to your customers



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