

# HSM Associates

## Road safety Education & training Division

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## An introduction to

This is an introduction to **Eco driving**, a smart new driving style that improves energy efficiency and traffic safety. It concerns one manual out of a series of three that have been developed within the framework of the international project that was carried out in the period 2005-2008 on behalf of the European Commission. The three manuals concern the following topics:

- Mobility Management
- Cleaner fuels & vehicles
- Eco driving

This introduction to **Eco driving** is based on the version developed for the EC Treatise project.

**Eco driving** is a smart way of driving, which contributes to the reduction of fuel consumption, the emission of green house gases and accident rates.

**Eco driving** is an adapted driving style, which best fits modern engine technology.

**Eco driving** means smart, smooth and safe driving at lower engine speeds (1,200 – 2,500 revolutions per minute), which saves 5-10% fuel on average without an increase of travel time.

New developments in engine technology have made possible a new, more efficient and more attractive way of operating passenger cars, lorries and busses. This way of optimised vehicle operation is called **Eco driving**. Most of the driving techniques of **Eco driving** are also applicable to older vehicles. **Eco driving** offers benefits for drivers of private cars, company cars, lorries and busses and for fleet owners including cost savings, increased safety, more comfort and fuel savings. Several European countries have implemented a more or less successful programme on **Eco driving**.

**Eco driving** comprises the following five elements:

- Educating novice drivers;
- Re-educating licensed drivers;
- Fuel saving in-car devices;
- Tyre pressures;
- Purchasing behaviour (e.g. car labelling).

All five are integral elements of conscious and responsible vehicle handling. Energy-efficient purchasing behaviour and energy-efficient driving behaviour are two ends of the same awareness process.

The most (cost-)efficient way of spreading **Eco driving** is to get it incorporated in driving school curricula and driving tests.

When novice drivers are taught **Eco driving** from the very first beginning, for most of them it will become a normal way of driving.

Although it is important to start at the very beginning to teach drivers a desirable driving style, it is also important to train current licensed drivers. They have been taught a driving style, which does not fit today's engine technology. For example drivers change gear at far too high revs. Over the last decades engines of passenger cars, lorries and busses have changed significantly, while driving style of most drivers has not moved with the times. Driving in a slightly different way that complements new engines will give benefits in cost savings, safety and comfort. With the right driving style training programme, drivers can save an average of 5-10% on fuel. Some drivers even reach savings of over 20%.

Checking tyre pressures is not usually a priority when inspecting the vehicle, although common pressure losses of around 0.1 bar per month mean that over 12 months about 1.2 bar pressure will be lost. If the pressure is too low, the tyre resistance and fuel consumption increase. Driving with low tyre pressures is also unsafe because of the negative effect on road holding and braking. Results of surveys in several European countries show that about 50% of all passenger cars are driven with too low tyre pressures.

In case of relative fuel consumption the fuel consumption of a particular vehicle is being compared to the average consumption of cars of a similar size. In some EU-countries, the energy label for cars is similar to the label that is being used for washing machines and refrigerators. The label shows the relative fuel consumption in a particular colour,

which immediately shows whether the vehicle uses more or less fuel than other comparable vehicles. Yellow means that the fuel consumption is average, red means it consumes more fuel, and green means it consumes less than average.

During and after a trip, drivers, fleet owners, instructors and novice drivers can use various systems to check and optimise the driving behaviour and fuel consumption. In several field tests devices such as econometers, on-board computers, cruise controls and speed and revolution limiters have proved to save fuel and sometimes even to increase traffic safety resulting in a drop of accident rates. These devices already have positive effects on driving style. In field tests with commonly available in-car devices drivers were able to save 5% fuel on average. Individual savings sometimes exceeded 10%. Field tests with more sophisticated experimental feedback instruments resulted in fuel-efficiency improvements of even up to 20%. The use of fuel saving in-car devices supports a fuel-efficient driving style and optimises an **Eco driving** style after having taken training courses.

In the last decades, engine technology and performances of passenger cars, delivery vans, trucks and buses have improved significantly. Petrol and diesel vehicles have become far cleaner in terms of their 'air quality' emissions i.e. emissions that affect human health. This is the result of e.g. the introduction of catalytic converters, which reduce emissions of CO, HC and NO x and of selective catalytic reduction systems, which reduce diesel NO x emissions.

There have also been some improvements with conventional fuelled vehicles' fuel consumption and CO<sub>2</sub> emissions. Unfortunately these improvements are only partly realised in 'real life' traffic. This is due to the fact that most people do not drive their car the way its engine was designed and calibrated. Passenger cars have to pass an obligatory test cycle to determine several exhaust emissions (regulated emissions). This test cycle has been designed according to a directed fixed format of the European Commission.

The European Commission has also determined maximum levels for regulated emissions. Car manufacturers calibrate the engines of their cars within the boundaries of a delicate equilibrium of optimal driveability and optimal exhaust emission levels. Engine calibration optimally fits test cycle conditions. However, the calibration does not fit common driving styles well. However it is possible to approach the optimal conditions if the driver uses **Eco driving** techniques

**Eco driving** reduces:

- fuel consumption;
- vehicle repairing and maintenance costs;

- stress;
- noise nuisance;
- local air pollutants;
- greenhouse gasses;
- accident rates.

Eco driving improves:

- traffic safety;
- comfort.

The safer driving behaviour results from:

- An anticipating driving style
- Maintaining a steady speed
- Less speeding
- Less overtaking
- Less stress/aggressiveness

To obtain further information about eco-driving techniques or to arrange Group Seminars and courses for safe, eco-friendly and skilled driving courses please go to:

<http://www.hsmassociates.eu/roadsafety.html>

Alternatively email: [det@hsmassociates.eu](mailto:det@hsmassociates.eu)

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