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Fuelling Road Safety

By Leonard Evans

When the cost of crude oil doubled between May 2007 and May 2008, the price of petrol at the pump in the USA jumped from (approximately) 40p per litre to 56p per litre. This 40% increase produced the greatest jolt to US driver behaviour since the October 1973 Arab Oil Embargo. When petrol hit 56p per litre, Americans were locked into the consequences of decisions made in an era of far less expensive fuel; they lived a long distance from work, and commuted in high fuel-consuming vehicles.

The 40% price increase produced clear evidence that the response by Americans was to drive fewer miles, even though the reduction was only a modest few percent. The consequence of this reduction provides useful insights into safety issues that apply beyond the shores of the US. A recent study¹ estimates that the reduction in travel caused by the fuel price increase would reduce US traffic fatalities in 2008 by about 10%. The estimated total of about 37,000 deaths for 2008 would be the lowest annual total since 1960.

Less Is More

Why does a small reduction in miles travelled lead to so large a reduction in traffic deaths? The reason is that different types of driving are preferentially curtailed as petrol prices increase, and different types of trips have different risks. Most travel is commuting to work, and this remains largely unaffected by fuel costs. There are, of course, some minor effects - high fuel costs coincide with a sluggish economy producing some job losses; high

fuel costs also encourage more carpooling and use of public transport, and some organisations have encouraged, or even instituted, four-day working weeks. Compared to the total miles travelled in commuting that remain unaffected, these are small effects and the net result is that the total commuting miles remain relatively unaffected by fuel prices.

The reduction in total miles travelled comes mainly from discretionary travel. This type of travel poses a far higher fatality risk than commuting travel because it involves higher average speeds. In turn, speed is the dominant factor in determining accident severity and fatalities (fatality risk increasing in direct correlation to travel speed). Commuting travel speeds are kept low by congestion, while discretionary travel may involve high-speed intercity travel, as well as being at times of reduced congestion and leading to higher speeds. Discretionary travel is more likely during the hours of darkness. Higher fuel costs lead to larger reductions in travel by drivers with limited funds, including

young drivers and drivers in lower socio-economic groups. Such drivers have above-average crash risks, so reductions in their driving will more than proportionally reduce traffic deaths.

A Thirst For More

One discretionary trip that is likely to be curtailed as rising fuel costs leave less money for entertainment is driving to bars and restaurants that serve alcoholic beverages. This, in turn, reduces driving with elevated blood alcohol levels. Alcoholics and problem drinkers are responsible for about one third of US traffic deaths. Higher fuel costs could use so much of their money that they could no longer afford bar prices and be forced to seek a cheaper way to drink. This is available by purchasing alcohol in supermarkets and taking it home. After a night's drinking, the alcoholic or problem drinker rolls into bed instead of getting behind the wheel, with great benefits to road safety. Drivers choosing to reduce speed on freeways to conserve fuel will save modest amounts of fuel, but will sharply reduce their

fatality risk. Reducing speed from 70 mph to 65 mph can reduce fuel use by about 8%, but fatality risk by 26%. I don't expect many drivers to slow down in order to save fuel. However, even a few doing so will contribute to reducing fatalities because the fatality rate increases so steeply with increasing speed. Substantial fatality reductions would result from enacting, and enforcing, lower speed limits. The US nationwide 55 mph speed limit, introduced in 1974, was a major contributor to the largest ever one-year drop in fatalities of more than 16%, from 54,052 in 1973 to 45,196 in 1974.

Big Savings

The higher 56p per litre for petrol in the US must seem an unbelievable bargain to drivers on the European side of the Atlantic, where the major component in the cost of fuel is tax, not crude oil. When the crude oil component increases, the percent increase at the pump will be far less than in the US. Reductions in travel will likely occur, leading to even larger reductions in fatalities, but the fatality reduction will be smaller

than in the US. This is why the US experience is informative. Until recently there were vociferous denials that increasing the cost of fuel had any effect on how many miles were driven. It took the 40% increase to convince them that basic economic laws do apply, and are likely to apply even when changes in miles driven are too small to be clearly observed. Increases in the price of crude oil are likely to lower fatalities in many countries, but the reductions in the US will be far larger. This will improve the safety performance of the US compared to other countries, an improvement that could negate the conclusion in the chapter *The Dramatic Failure of US Safety Policy* in my book *Traffic Safety*.² That conclusion was that the safety performance of the US is abysmal compared to that in other countries. The data in Figure 1 additionally supports that conclusion.

The graph tracks the number of traffic deaths in the US and Britain since 1972, with the 1972 totals for both countries set to x100. In 2007, traffic deaths in Britain dropped below 3,000 for the first time since records began in 1926, a 62% drop from the 1972 total. To record a 62% drop in fatalities, the US would need to record less than 25,000 road fatalities. For US traffic deaths to drop to 37,000 is a notable achievement, but the US has clearly an enormous way to go

to catch up with Britain (and other countries).

It is commendable for traffic deaths in Britain to drop below 3,000 in 2007. However, 3,000 people dying every year is no cause for celebration - all countries have a long way to go. All the effects above have been the result of changes in driver behaviour, showing again that it is the behaviour of drivers that overwhelmingly determines the number of traffic deaths. These changes may have resulted from reduced driving, but there are many proven ways to sharply reduce deaths without reducing mobility. The goal should be not to reduce driving, but to reduce driving drunk, reduce driving too fast, and reduce driving in ways that pose threats to the driver and other road users.

Competition: Leonard Evans has kindly offered a copy of his highly acclaimed book 'Traffic Safety' (see review adiNEWS July 08) to one lucky reader.

Q: What year was the national 55mph limit introduced in the US? First correct answer out of the hat wins. All entries to the usual addresses on page 3 by 20th October.

References:

1. Michael Sivak, The University of Michigan Transportation Research Institute, Ann Arbor, Michigan, USA. Report No. UMTRI-2008-39, July 2008
2. Leonard Evans, *Traffic Safety*. Bloomfield Hills, Michigan, USA: Science Serving Society; 2004. More information at www.ScienceServingSociety.com

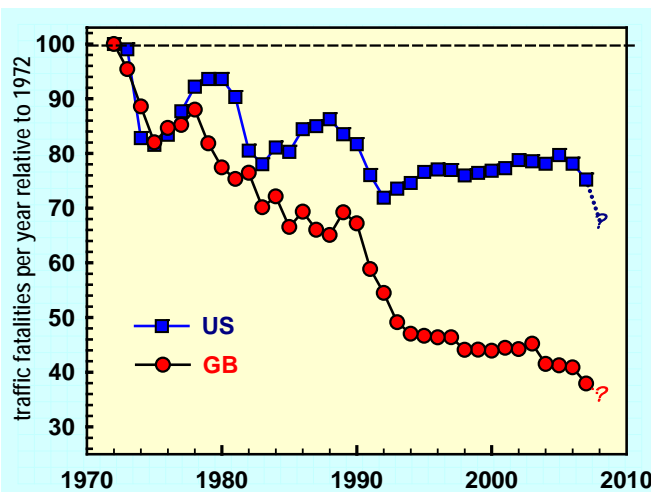


Figure 1. The number of traffic deaths in Britain and the US relative to their 1972 totals. In 1972, the US recorded 54,589 traffic deaths and Britain recorded 7,763. For 2007, the US recorded 41,059 (a 24.9% decrease from 1972) and Britain 2,943 (a 62.1% decrease from 1972).