

What is the opportunity cost of 1kg weight on a new vehicle?



travels 1 million kilometres, the total fuel usage associated with 1 tonne weight is 5000:1. If the cost of fuel over five years averages \$2/litre, then the added fuel cost is \$10,000/tonne which is \$10/kg. Assuming the average weight of the B-double truck on all its journeys is 50 tonne, then over its life it will use about 595,000 litres of fuel.

There is also an opportunity cost of the additional weight. Additional weight reduces the carrying capacity, but only when the vehicle is fully laden to its regulated axle limits. For most trucks this rarely happens because they are seldom fully loaded. Bulk goods trucks, such as tankers, grain trucks and tip-trucks often depart fully laden.

payload. The current cartage rates for carrying 1000kg load 100 kilometres is about \$500. The lost revenue for carrying 1000kg for 1,000,000 kilometres (assumed truck life) with lost opportunity 7.5 per cent of these kilometers would be $\sim 0.075 \times \$500 \times 10,000 = \$375,000$ or \$375/kg.

The opportunity cost dominates over the fuel usage penalty. For a fuel tanker that is always full as it leaves the depot and returns empty, the opportunity cost is higher because 50 per cent of the time it is fully loaded. The opportunity cost for a full tanker is \$2500/kg. 'Cubic' trucks, which are not limited by weight, have no load-carrying opportunity cost. However, they may have a 'cubic' capacity

New vehicle buyers have to consider the value of the options available. But, what is the value of 1kg of tare weight?

Tare weight delivers no income, but it is necessary to make money. Here are my thoughts about its value.

Let's consider a prime mover pulling a B-double trailer set. The Gross Vehicle Mass of the truck is 23,000kg. The addition of 1kg of installed weight reduces the carrying capacity. It also increases the tyre losses and probably reduces fuel economy.

Typical fuel economy for a lightly laden B-double (weighing 28 tonne) is 50 litres/100 kilometres whereas for a fully laden B-double (weighing 65 tonne) the fuel economy is ~ 69 litres/100 kilometres. Therefore, it takes an additional half a litre of fuel to carry 1 tonne of weight 100 kilometres.

For a truck with a five year lifespan that

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Roadside inspectors tell me that between 5 per cent and 10 per cent of heavy vehicles that are intercepted are found to be overweight. I will assume that about 7.5 per cent of heavy vehicles are close to fully loaded.

The addition of 1kg of weight is assumed to reduce the carrying capacity on 7.5 per cent of trucks. The other 92.5 per cent of trucks are not fully laden so the additional tare weight does not displace

loss if the added weight encroaches on the load space.

There is also an installation and maintenance cost for any system that is installed onto a truck. This varies depending on the nature of innovation. Ignoring this cost, the cost of one kilogram of added weight on a new truck is somewhere between \$10 and \$2500, depending on whether the truck is lightly laden all the time or fully laden half the



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time. My guess is that for an 'average' operation, the value is \$375 but this depends greatly on the nature of the heavy vehicle and its operation.

The question for the buyer is what value the extra kilogram brings to the operation. A roof deflector might weigh 40kg, for example. Its opportunity cost is \$15,000, which is much greater than its cost as an option on a new truck. The deflector might improve the fuel economy by 3 per cent. That is a saving of 17,850 litres of fuel over the life of the truck, which is worth \$35,700 using my assumed \$2/litre. It is worth doing. The best innovations

improve the efficiency and safety of the truck but do not weigh much – hence the interest in low rolling resistance tyres and wide base tyres.

ITTEC 12 Outlook Conference

ARTSA, in conjunction with Prime Creative, the Victorian Transport Association (VTA) and Transport Industry Council (TIC) is holding the ITTEC 12 Outlook Conference on 13 and 14 March 2012, just before the International Truck, Trailer and Equipment Show. This premier conference is held in conjunction with the event. The venue is the fabulous Lifesaving



Victoria on the beach at Port Melbourne.

The ITTEC12 Industry Outlook Conference will focus on the industry outlook over the next five years – including the international scene, Australian market conditions, equipment developments, productivity enhancements, manpower issues, road safety, customer expectations, etc. There are 35 invited speakers and panelists. Their insights will help you position properly for the future. If you operate trucks, design trailers, sell equipment, manage people or think about regulations, please come to the conference to participate and learn.

For more information, please visit www.trucktrailerconference.com.au.

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