



28 September 2017

Submission to the National Road Safety Strategy Inquiry

By Charlie Nelson, Managing Director

My submission covers two analyses related to road trauma.

The first is a report I wrote in January this year concerning the worrying rise in the number of fatalities in 2015 and 2016. That report accompanies this submission.

I found that much of the increase in 2015 and 2016 could be attributed to the fall in the price of automotive fuel over that period. The correlation is statistically significant over the period 2006 to 2016 (see Chart 2 in my report). The fact that road fatalities are **down** by 7.4% over January to August this year, compared with the corresponding period in 2016, validates my finding as the price of automotive fuel has **risen** by 11.4% over the first two quarters of 2017, compared with the first two quarters of 2016.

Since writing that report, I have analysed passenger vehicle km travelled (BITRE data) and found that higher automotive fuel reduces km travelled and so does increased mass transit share of the motorized passenger task. Charts 1 and 2 illustrate those relationships, which are statistically significant.

Thus, part one of my submission concludes that the price of automotive fuel has a significant impact on road fatalities and passenger vehicle km. My hypothesis is that higher prices for automotive fuel reduces discretionary vehicle usage. My finding that passenger vehicle km is reduced by increased mass transit usage suggests that improved mass transit services may contribute to lower road fatalities.

The price of automotive fuel will vary and we at least need to know the impact that will have on road trauma so that we can focus on the factors that we can influence. One of these would be increased access to public transport.

The second part of my submission concerns the changing age distribution of the population and differential rates of fatalities per 100,000 population by age group. The highest fatality rates are amongst people age 17 to 25 and 75+ (Chart 3). These two key age groups will have very different population growth rates over the next several years (Chart 4). In particular, the 75+ age group will exhibit very rapid growth due to the baby boom which commenced during and after World War 2, while the 17 to 25 age group is likely to shrink due to the fall in births between 1993 and 2001.

This means that, while continuing to encourage safer driving behaviour amongst young adults, a strategy for reducing road fatalities amongst people aged 75+ is urgently needed. This could training courses designed for the older driver, protective



equipment given that older people are more frail, and special transport services for older people.
I would be happy to provide the inquiry with details of my regression analyses, should that be of interest.

Chart 1

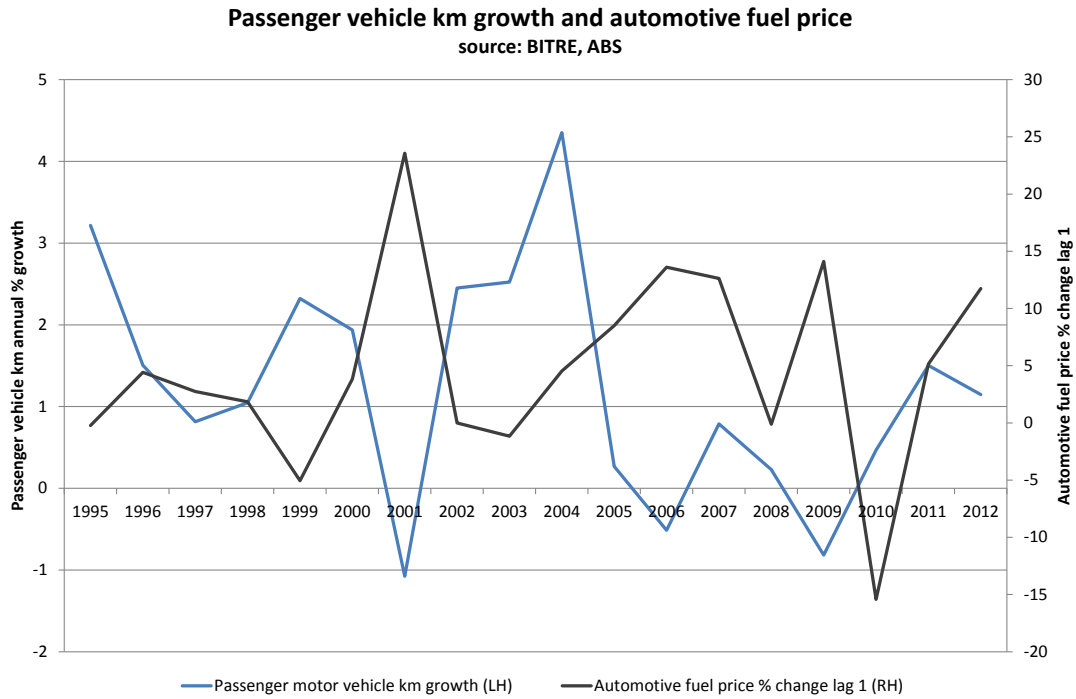


Chart 2

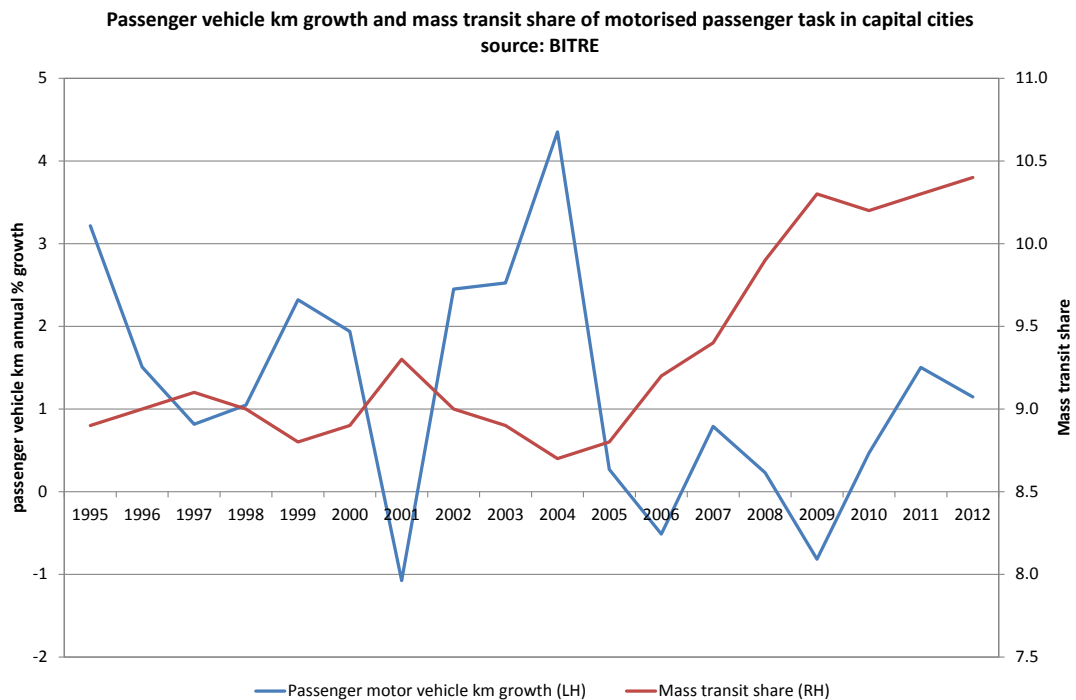




Chart 3

Road fatalities per 100,000 by age group
source: BITRE Road Trauma Statistical Summary

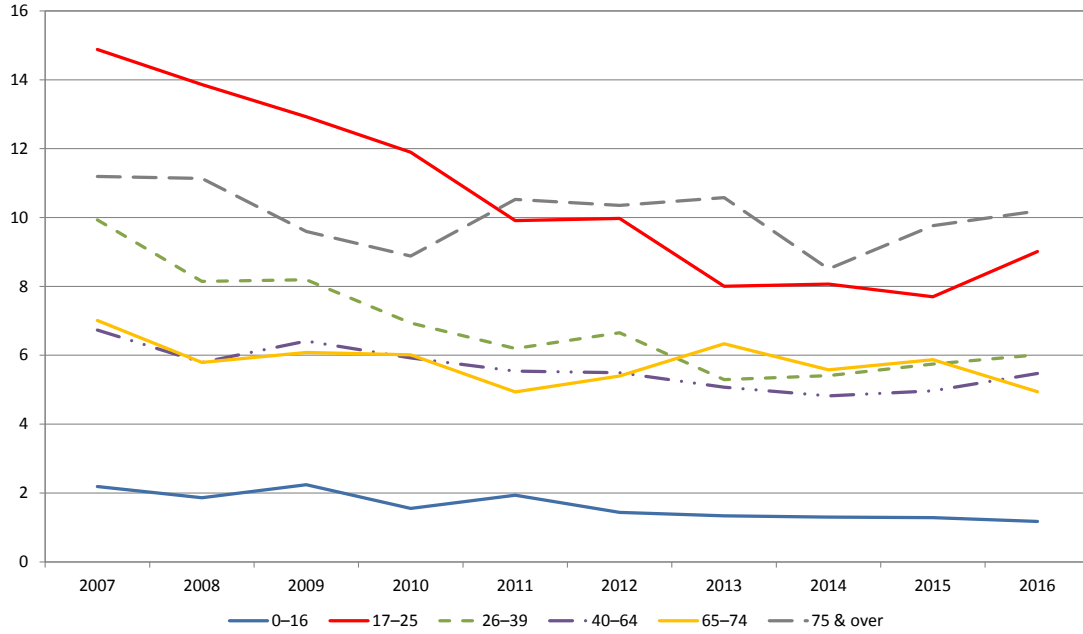
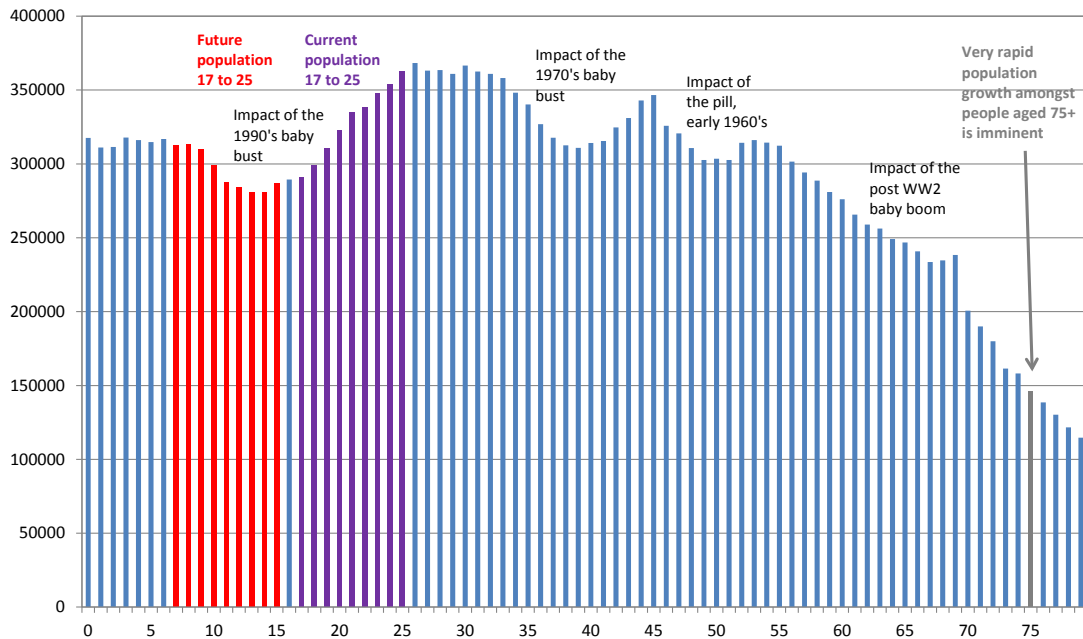


Chart 4

Resident population by age up to 79: 2016
source: ABS 3101





Road Toll Trends in Australia

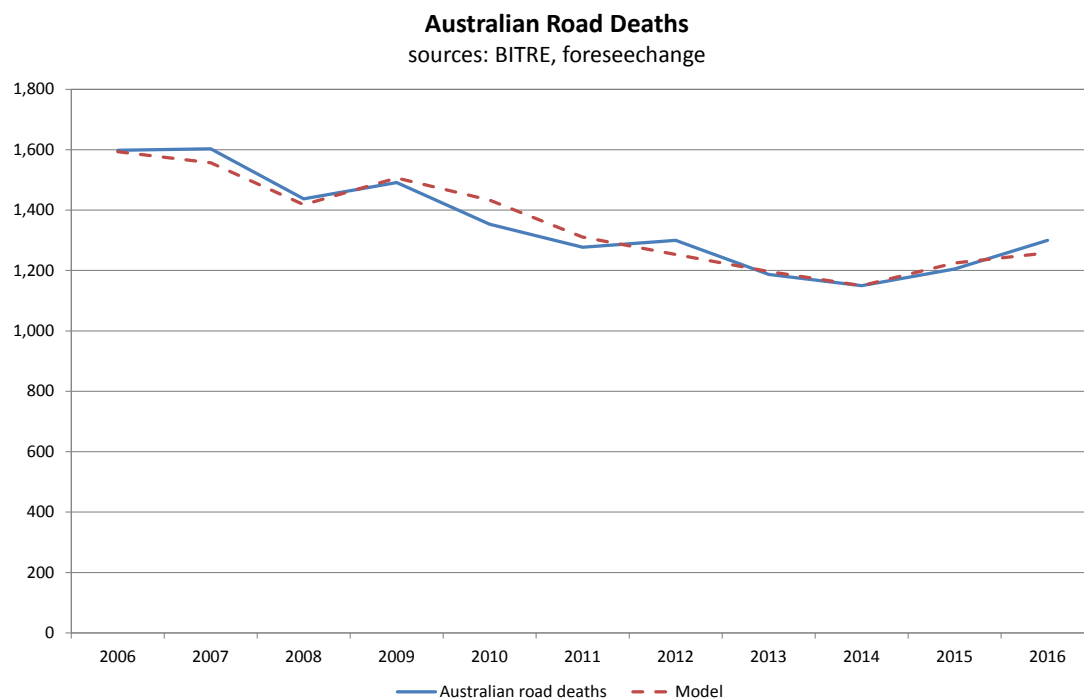
Charlie Nelson
January 2017

Australia's road toll increased by 55 in 2015 and by another 95 in 2016.

Does this mean that the downward trend observed in previous years has come to an end and that the trend is now upwards? We can explain most of the actual variation between 2006 and 2016, so the downward trend is probably not over.

The data between 2006 and 2016 and our model fit are shown in Chart 1.

Chart 1



The model has two factors:

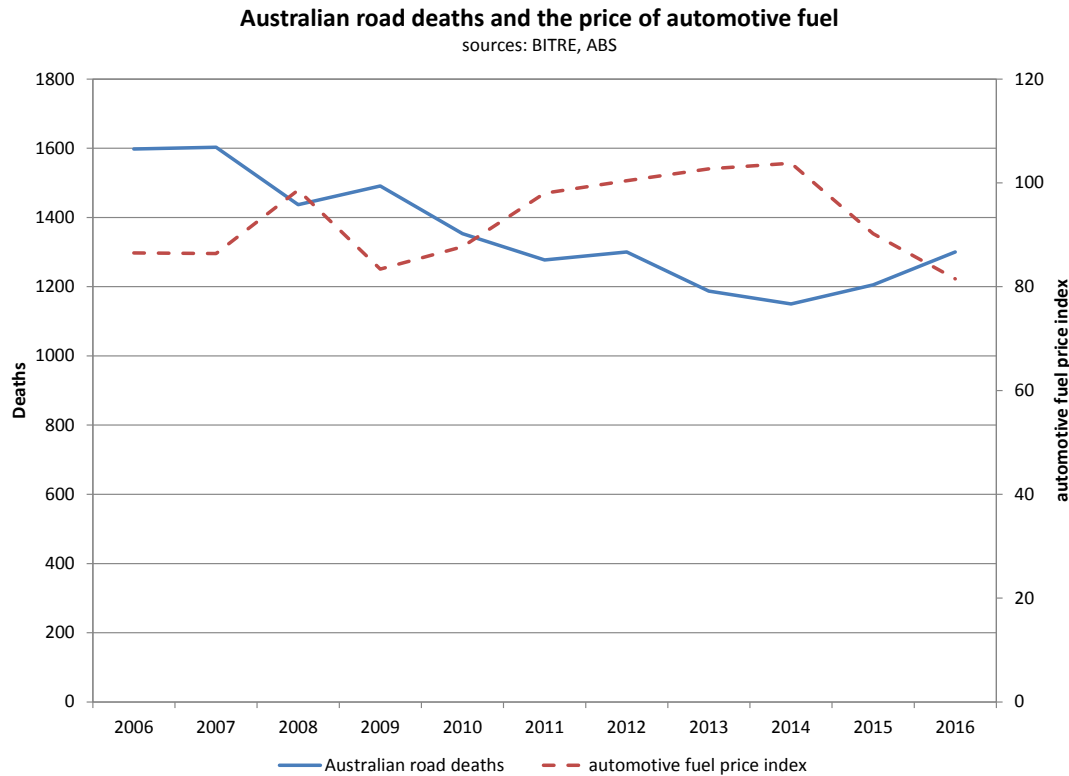
1. A downward trend of 38 deaths per year. This trend is an amalgam of factors such as the number of vehicles on the roads, distance driven, driving conditions, driver behaviour, and improvements in car safety features. This downward trend is a good thing and should be encouraged to continue.
2. The price of automotive fuel. Price decreases since 2014 have put a temporary stop to the downward trend, possibly caused by increased distances and speeds as driving becomes more affordable.

The relationship between the number of deaths and the price of automotive fuel is illustrated in Chart 2. There is clearly a negative correlation and it is statistically significant.



The negative correlation occurs throughout the time period, not just in the last two years.

Chart 2



This very simple model explains 94% of the variance in the data. There are five years where the model fit is temporarily not as good as the others and reasons for the first four are readily identified.

Deaths were higher than expected in 2007 and 2012, by 47 in each year. The states mostly responsible were Queensland and Western Australia and these were peak years for the mining construction boom. Our hypotheses is that there was more traffic on these roads at these times.

Deaths were lower than expected in 2010 and 2011 by 80 and 34 respectively. These two years had the highest rainfall since the 1970's. Our hypothesis is that less driving, and / or less dangerous driving, occurred in these years.

We will need to find a candidate cause for the 41 higher than expected deaths in 2016. This will involve detailed examination of the actual accidents. The biggest increase from 2015 was amongst drivers (up by 74, while passenger deaths were down by 45) and amongst motor cyclists (up by 45).

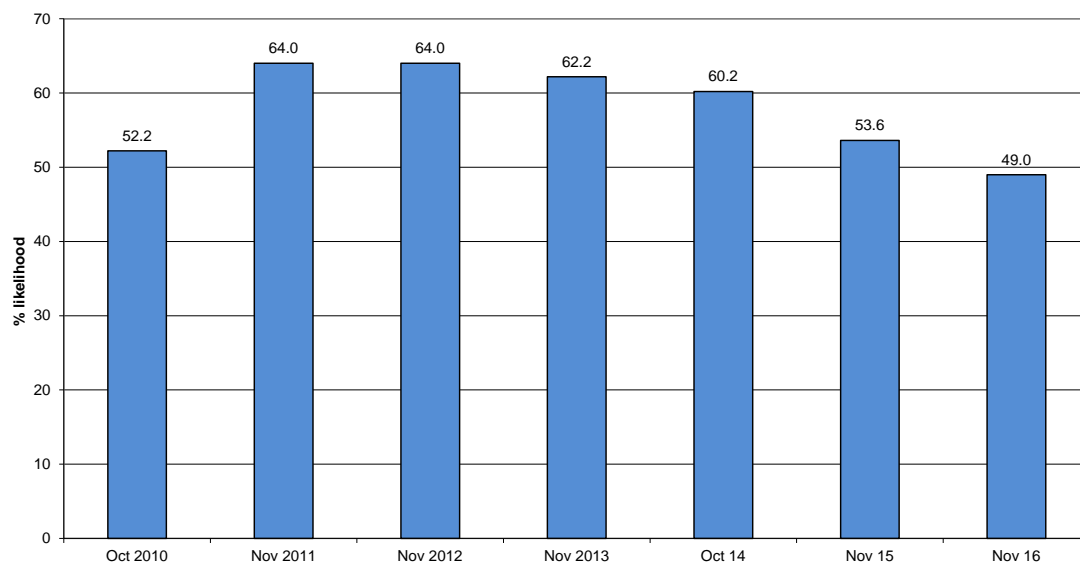
The price of automotive fuel could be a stronger than usual contributor in that from late 2015, there was a significant decline in the perceived likelihood of a large increase in the price of petrol in the year ahead (Chart 3). Our hypothesis is that by



late 2015, more people expected that the price would be lower for longer and that this may have impacted the choice of vehicle purchased (such as in favour of more powerful vehicles) and also driver behaviour. There was no significant decline in the expectation in late 2014 and so lower prices were more of a surprise in 2015, than in 2016.

Chart 3

Large rise in the price of petrol - Wisdom of the Masses estimate for following year
source: foreseechange



This data is based on surveys of the general public, which ask respondents to estimate the likelihood that particular events will occur in the year ahead. The scale is from zero (= no chance) to 100 (= certain). Other events measured in this way include a severe economic slowdown, a rise in unemployment, and clear signs of global warming.

Conclusions and implications

We have been able to offer an explanation for most of the variation in Australian road deaths over the period 2006 to 2016 and have provided a tentative hypothesis for most of the deviations from the model.

The main factors causing the deviation from the downward trend have been recent declines in the price of automotive fuel, peaks in the mining construction boom, and two very wet years.

The price of oil has risen lately and the price of automotive fuel increased through the December quarter. If this continues, it will tend to reduce the road toll.

It would be feasible for the federal government to raise the automotive fuel excise. This would tend to reduce the road toll, reduce greenhouse gas emissions, and lift



government revenue. On the other hand, it would tend to reduce discretionary spending power (and so household consumption) and would have a larger impact on people without access to good public transport.

While we should continue to search for a definitive explanation for the 2016 spike, it is too early to declare that the long-term downward trend is finished. This means that we should continue recent strategies of insisting on safer vehicles, driving conditions, and driver behaviour.