

SPEED MANAGEMENT: Making Use of Informal Methods of Social Control to Curb Speeding Behaviour on SA Roads

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ABSTRACT

Speed of vehicles and the problems it causes in traffic flow has long been considered one of the most important contributors in crash causation. Research focuses on speeding behaviour along with other external and behavioural factors linked to risk-taking and unsafe driving behaviour have been strongly debated throughout road safety research literature. Although a combination of traffic offences contribute to South Africa's dreadful road crash and injury record, speed of vehicles is considered as one of the main factors contributing to the escalation in traffic crashes. Most South Africans experienced the 2008 global credit crunch with a number of rate increases from the Reserve Bank throughout the year. The escalating interest rates had a ripple effect on the South African economy including rises in the fuel price which brought along a hike in food prices and other basic living costs, which normally stems from a soar in prices related to transport services. Although fuel prices came down in August 2008, other living costs are still on the increase and costs associated with travelling especially are seemingly out of control. The purpose of this paper is to contemplate the effect that external or social control methods, such as the government raising interest rates indirectly could have on the driver population of South Africa perception of speed. Simply put: Did drivers consciously or unconsciously drive slower, in order to save costs directly related to fuel and indirectly related to saving on living costs in general. It is hypothesized that in theory there should have been a decrease in overall speeds of privately owned vehicles because of the high fuel prices and that by driving slower and keeping to the speed limit, people will have saved on the cost of fuel and travelling in general. This could be considered as an indirect method where exerting external social control through monetary means had a significant effect on influencing driver behaviour through the increased cost of living.

SPEED AND ENFORCEMENT ON SA ROADS

Speed of vehicles and the problems it causes in traffic flow has long been considered one of the most important contributors in crash causation as well as being at the core of road safety problem (Road Traffic Authority New South Wales: 2003; Van Schagen & Goldenbeld: 2007). Legislation pertaining to speed for South African roads and drivers are well documented in a variety of official documentation (Mackey and De Roodt: 2002). Legislating speed limits include setting the limits, defining sanctions for those that do not adhere to the rules; as well as specifications of the equipment used by the enforcement authorities.

The engineering process of setting speed limits is specialised and considers a wide array of factors, including the number of crashes, existing engineering interventions, type of vehicles, road users, vehicle volumes, modes of transport, road alignment, socio-economic and human factors; as well as the road environment in general. Fieldwick and De Beer (1988) emphasises that an urban speed limit is a necessary and effective road safety tool. Speed limits are an important part of speed management, as posted speed limits convey important information related to what the maximum speed is for a certain road—in order for a driver to adopt a safe speed considering the prevailing conditions. Roads have set speed limits that fit the individual roads' primary function and are determined considering the quality and type of road, the type and mix of road users and traffic as well as the surrounding environment.

Law enforcement activities and engineering interventions, such as camera speed enforcement and traffic calming on lower order roads, are by far the more popular methods of speed control in South Africa. Road user or more specifically driver education follows with social marketing messages that focus specifically on speed-related behaviour. Although South Africa has extensive legislation

and regulations regarding speed behaviour, but compliance with these regulations still lies in the road users' understanding of when, where, how and in South Africa "why should I" comply. Law enforcement might not be the only method for controlling deviant behaviour of individuals such as drivers exceeding the speed limit. In general people who violate norms can be subjected to gossip, public ridicule, social ostracism, insults, and even threats of physical harm by other members of their community.

"Social control entails rules of behaviour that should be followed by the members of a society. Some of the rules of conduct fall into the realm of good manners as the culture define the rules" (Social control Law website: 2006).

EMERGING SOCIO-ECONOMIC PRESSURES ON SPEEDING BEHAVIOUR

The escalating interest rates of the past year and a half had a ripple effect on the South African economy that included rises in the fuel price in 2008 which brought along a hike in food prices and other basic living costs (Naidu: 2008; IOL: 2008; Cillie: 2009), which normally stems from a soar in prices related to transport services. The fluctuating increases and short-lived decreases in the fuel price influences South Africans one way or another.

The theory put forward in this paper is contemplating on whether or not the escalation in fuel prices, brought about an unintentional reduction in speed behaviour on SA roads. Is it possible that drivers consciously or unconsciously drive slower, in order to save costs directly related to fuel and indirectly related to saving on living costs in general?

SPEED PICTURE FOR SA ROADS

The RTMC provides road safety and related data reports through the Arrive Alive website. This seems to be the un-official communication channel of the RTMC as well the National Department of Transport with the public; as well professional communities in South Africa

In an attempt to paint a picture of speed behaviour that is contributing to crashes on South African roads, use was made of available information in the form of reports posted by the RTMC and NDOT on the Arrive Alive website. This information seemed to be the only official source of data that is publically available. This picture should essentially show a detailed analysis of road crash and related data for the last ten years. Unfortunately the different year reports were not consistent year-on-year or standardised in such a way that data and findings pertaining to specific sections of the reports on road traffic crashes in South Africa could be compared for the period 1998-2008/9.

One of the more consistent indicators on which there was feedback every year was the number of fatal crashes and fatalities that occurred during the festive season, December of each year (Figure 1). This indicator seems to benchmark the road safety status quo of SA through the number of fatalities in the report back to the nation in January each year.

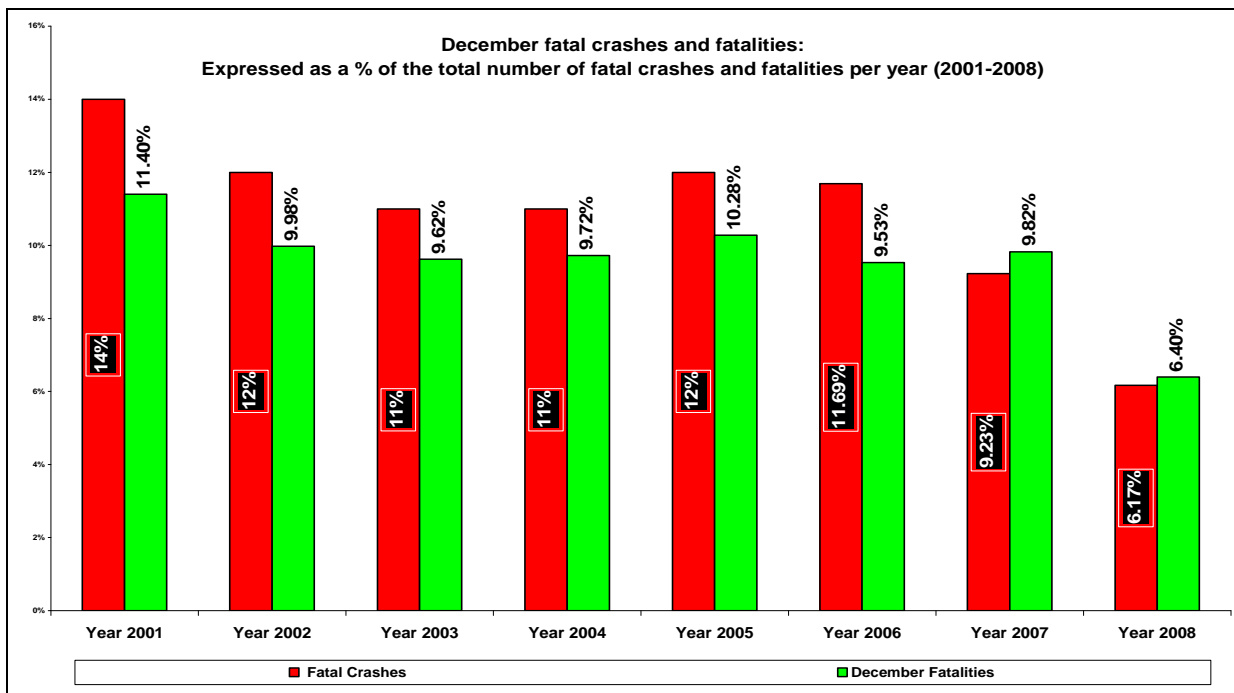


Figure 1: December fatal crashes and fatalities as a percentage of the total number of crashes per year

In an attempt to understand speed as a contributory factor in fatal South African crashes, speed was expressed as a proportion (percentage) of the total number of reported fatal crashes per year as well as December fatalities for the past 8-10 years. As indicated earlier the Road Traffic Management Corporation reports are not standardised year-on-year and the units in which the findings are expressed not always consistent, it was therefore necessary to adjust figures for statistical comparison. Despite the difficulties experienced with comparing data sets it does seem as if excessive speeding behaviour is escalating year-on-year (Table 1). This might be an indication that more strategies and policies are needed in order to curb this problem (Botha and Van der Walt: 2006; Jungu-Omara & Van der Walt: 2006). A total of seventeen different reports including the RTMC publications for the years 2001-2008 were scrutinised in an attempt to compile and verify the data tabulated below.

Table 1: Speed on SA roads for the period 2001-2008

	Speed was a factor in...crashes	Fatal Crashes in December	Speed related fatal crashes	Average exceeding speed limit
Year 2001	no estimates or reference to speed as contributory cause	935	no estimates or reference to speed as contributory cause	no estimates
Year 2002	30%	976	293	21.42%
Year 2003	28%	950	266	20.54%
Year 2004	29%	993	288	21.23%
Year 2005	40%	1201	480	26.50%
Year 2006	no estimates or reference to speed as contributory cause	1220	no estimates or reference to speed as a contributory cause	30.40%
Year 2007	no estimates or reference to speed as contributory cause	1261	no estimates or reference to speed as contributory cause	no estimates
Year 2008	75%	733	550	no estimates

Figure 1 (RTMC: 2001-2009), confirms that there was a decrease in fatal road crashes and associated fatalities during the December 2008-January 2009 holidays. The RTMC indicated that the reduction in fatalities was not due to fewer vehicles on the road, as would be expected in the light of the financial crisis, but rather it was attributed to the success of the Arrive Alive campaign, increased visible policing and enforcement. These figures seem to be used as an indicator for feedback on progress with regard to a reduction in crashes and specifically in this instance as to how the NDOT is faring with its strategic vision of reducing road traffic accidents by half in 2014. But in the RTMC (2009) media report issued, the indication was that “*speed was still the contributory factor in approximately 75% of crashes*” during the December 2008-January 2009 festive season. This might mean that drivers are still not adhering to the speed limit as one would expect in the light of the financial crisis experienced in South Africa.

PERCEPTION OF SPEED

An article published in 2005 (Masango: 2005) revealed that 30% of drivers exceed the 120km/h limit, with about 14% exceeding 130 km/h and 6% driving faster than 140 km/h. This was the findings of an extensive speed analysis of about 25 million vehicles of all types in 2004. Bester and Geldenhuys (2007) stated that the percentage of vehicles (excluding trucks, minibus taxis and buses) exceeding the posted speed limit on roads in South Africa decreased between the years 2002-2005, but that there was an increase in all vehicle speeds (excluding trucks, minibus taxis and buses) the following year 2006. They concluded that an increase in fatal crashes due to inappropriate speeds in 2006 could be expected. Van Niekerk (cited in Bester and Geldenhuys: 2007) also found a strong correlation between a high crash rate and the percentage of vehicles exceeding the speed limit on roads in the Western Cape.

One of the reasons cited to influence adherence to speed limits is the fact that speed limits need to be credible, in other words should for the majority of the driving population be comfortable and safe on a particular stretch of road (Goldenbeld & Van Schagen: 2007). Where there is general acceptance and agreement that the posted speed limit for a specific road is reasonably correct it might be perceived as credible and the posted sign might informally facilitate more compliance with the rule. Concern about the level of lawlessness and the lack of discipline among South African Drivers are expressed in most of the RTMC documentation and is addressed in a number of other publications (Botha & Van der Walt: 2006; Jungu-Omara & Van der Schuuren: 2006; Bester & Geldenhuys: 2007). The costs (environmental, operational, infrastructure, time-related as well as injuries and social and psychological) associated with crashes are enormous and Beukes and Van der Schuuren (2007) gave monetary estimates of R38 million per annum. According to their calculations (based on the notion that one third of all crashes are speed-related) at least R11.4 billion in South Africa should be allocated to speed related crashes. SWOV research confirmed the fact that at least one-third of all crashes can be related back to speeding behaviour of drivers (Van Schagen: 2008; Beilinson: 2004). Van Schagen (2006) indicates that between 35% and 45% of the driver population in the Netherlands exceeded the highway (autosnelwegen) speed limit of between 100km/h-120km/h in 2005. Recent Norwegian research again indicated that the lowering of speed limits (provided that road users comply with the lower limits) indeed lowered crash rates and the severity of injuries associated with high speed crashes. In Norway (Ragnoy: 2008) the effects of lowered speed limits were evaluated using an Empirical Bayes design, that entails a before and after study. This reduction in speed reportedly also brought about a reduction of 16% in injuries and 42% reduction in fatalities.

CHOICE OF SPEED: A COMPLEX HUMAN PROCESS

Driving behaviour and driving performance involves complex social and psychological processes during which driving behaviour is influenced by motives and attributes that are indirectly transferred to exist in other drivers. Beilinson (2004) points out, although problems associated with high speed behaviour is known and widely publicised, that in most instances observance and adherence to speed limits is low. In a survey that comprised (Van Schagen: 2008) of 8000 Dutch drivers the reasons (Table 2) were given in terms of why drivers do exceed the speed limit as well as why other drivers adhere to the speed limit.

Table 2: Reasons for exceeding or adhering to the speed limit in the Netherlands

Reasons for exceeding the speed limit	Reasons for not exceeding the speed limit
1. Adapting to other drivers' increase in speed	1. Safety reasons
2. Driver is late for meeting etc.	2. It is the law
3. No particular reasons	3. It is comfortable to drive at the correct speed
4. Driver did not notice the speed limit	4. High costs associated with speeding
5. Out of boredom	5. Not in a hurry anywhere

A driver's probability to be involved in a crash rises considerably when speed is increased. Due to unpredictable external and environmental factors, there is an increase in the demand for quickly processing stimuli from the outside and then still react safely on that stimuli. Cognitive abilities and context awareness becomes central to dealing safely with complex traffic situations when travelling at high speeds. Highways and roads where drivers travel at high speeds are therefore considered as more "crash prone" than residential areas where drivers are driving slower.

In the eighties Fieldwick and De Beer (1987) through a comprehensive study comparing South Africa with other international countries concluded that South African drivers favour higher driving speeds, than drivers in countries such as New Zealand, Finland and the USA. Today, most vehicles in South Africa are manufactured with the same speedometer and supposedly the same calibration. Considering speeding behaviour from this angle, i.e. that the speedometer is a credible indication of the travelling speed) bring about the conclusion that exceeding the speed limit (with the exception of special circumstances) is a choice. Reasons in both the speedster as well as the compliant driver group in Table 2, illustrates that a particular driving speed becomes a personal choice after all external and internal factors (Mehmood: 2007) were considered by the driver. It boils down to a deliberate decision by the driver to either adhere or to ignore the posted speed limit. Choice of speed becomes a complex process to understand. This decision process becomes a test intertwined with personal, socio-economic, environmental, temperament as well as underlying personality characteristics.

EXCESSIVE SPEED WITHIN THE CURRENT ECONOMIC SITUATION

The escalating interest rates had a ripple effect on the South African economy that included rises in the fuel price in 2008 which brought along a hike in food prices and other basic living costs, which normally stems from a soar in prices related to transport services. The fluctuating increases and short-lived decreases in the fuel price influences South Africans one way or another. The theory put forward in the first part of the paper is whether or not the escalation in fuel prices, brought about an unintentional reduction in speed behaviour on SA roads. In modern day is it possible that drivers consciously or unconsciously drive slower, in order to save costs directly related to fuel and indirectly related to saving on living costs in general?

Previous research efforts also suggests as much. Previous South African literature found that when the rural speed limit in the 1970's were lowered due to an oil crisis experienced in 1973 (OPEC fuel crisis) and in 1979 (Iranian fuel crisis) that driver behaviour were adapted accordingly. Along with the lowering of speed limits (Fieldwick and Fernie: 1980) the South African government of time also introduced another type of *social control* in the form of restricted hours for *buying* fuel. This formal method of control ensured that drivers had to adapt their driving style in order to make the best of the fuel they had to their disposal. Fieldwick and De Beer (1988; 1989) also indicated that the looming oil and fuel crises experienced during the 1980's contributed to drivers adhering to speed limits and obeying the law in an attempt to save fuel, but also in an attempt to stay clear from the informal social control carried out by fellow road users, who sanctioned those "wasting fuel" by waving arms and making verbal comments to those drivers who ignored the speed limit.!

Commercial literature suggests that the same type of informal social control might be exerted today. Not in the form of restricted fuel sales or the fear of being sanctioned by other drivers but in

the form of feeling the global economic crisis at home, and therefore applying self-discipline and good governance to personal spending, which could include less holidays or driving slower, and adhering to speed limits.

Internationally one of the responses to the global economic crisis has been to advise drivers to drive slower in an attempt to save costs on fuel (Shell: 2008). SA based car manufacturers, fuel companies and organisations such as NAAMSA and the AA have been issuing and publishing advice with regard to saving on fuel costs by driving slower. The logical assumption in the current financial crisis that South Africa is experiencing would be that drivers in South Africa would tend to adhere to speed limits in an effort to save fuel. The Feasta Organisation (2005) makes the following important points related to the then escalating fuel prices in SA:

- Consumers try to use less oil when there are increases in the fuel costs
- As road freight is the most common mode or method of transporting goods and people in South Africa, consumers have to pay more for public transport as well as for other necessities which means they have less money to spend on other things
- According to Feasta (whom are an environmental group) energy is saved when there is a reduction in activities of industries such as mining, construction, manufacturing etc. But on the other hand when consumer demand diminish due to the hike in oil prices, manufacturers are faced with surplus capacity and products, this will almost certainly result in various industries' experiencing severe economic constraints which could include closures, job losses etc.

CONCLUSION

Traffic crashes ultimately have their origin in the way that people think (cognitions and perceptions), act or react (behavioural aspects) and feel (emotional components) which makes it detrimental to take cognisance of the psychological and behavioural aspects which lies at the core of explaining most societal problems. Traffic crashes are to a large extent attributed to unsafe driving styles, unsafe driving habits and the one-sided perception that one is perhaps a better driver than the next motorist. Driving at excessive and inappropriate speeds is a personal choice and an attitude towards the enforcement authorities, towards fellow road users and life itself. Thus a change in thinking, perceptions, attitudes and behaviour is called for to address underlying causes of social problems such as road traffic crashes.

As part of a new approach, consideration should be given to the role and extent that social psychology and sociology practices can play in changing undesired behaviour. As these disciplines are associated with the understanding of human social behaviour, the motivation, cognition and emotions associated with underlying road user behaviour, it starts to make sense that deeper behavioural strategies are essential in changing unwanted behaviour. Although the primary objective of fuel hikes was totally different from attempting to alter any behaviour, the secondary and unintentional spin-offs of the action, could in the long-run contribute to making South African roads safer.

REFERENCES

Beilinson, L. 2004. *Speeding-a huge problem in traffic safety?* In Proceedings of the International Conference on Transport and Traffic Psychology. Paper 2.

Bester, C.J. & Geldenhuys, F. 2007. *Speed Trends on Major Roads in South Africa*. In proceedings of the 26th Southern African Transport Conference. CSIR: Pretoria.

Beukes, E. & Van der Schuuren, M. 2007. *An Evaluation of Intelligent Speed Adaptation*. In proceedings of the 26th Southern African Transport Conference. CSIR: Pretoria.

Botha, G. & Van der Walt, H. 2006. *Fatal Road Crashes Contributory Factors and the Level of Lawlessness*. In proceedings of the 25th Southern African Transport Conference. CSIR: Pretoria.

Cillie, J. *Petrol prys bly dieselfde*. Beeld 25 April 2009 Available online at: <http://www.beeld.co.za>.

- Feasta Organisation. 2005. *South Africa and the Oil Price Crisis*, Website available online at: <http://www.feasta.org>.
- Fieldwick, R and Fernie, B.E. 1980. The 70 km/h Rural Speed Limit and Accidents, CSIR National Institute for Transport and Road Research, Technical Report RF/4/80, November 1980.
- Fieldwick, R, 1984. Some Factors Influencing Traffic Accidents, CSIR National Institute for Transport and Road Research Technical Report RF/7/84, October 1984.
- Fieldwick, R., and de Beer, E.J.H. 1987. The Rural Speed Limit and Traffic Accidents, CSIR National Institute for Transport and Road Research Technical Report RV/26, January 1987.
- Fieldwick, R., and De Beer, E.J.H. 1988. Rural Speed Limit Changes and Safety, CSIR National Institute for Transport and Road Research Technical Report RR 645, 1988.
- Goldenbeld, C. & Van Schagen, I. 2007. The credibility of speed limits on 80km/h rural roads: The effect of road and personality characteristics. *Accident Analysis and Prevention* 39, 1121-1130.
- Jungu-Omara, I.O. & Van der Schuuren, M.J.W.A. 2006. *Ways of Reducing on South African Roads*. In proceedings of the 25th Southern African Transport Conference. CSIR: Pretoria
- Mackey, T.C. & De V Roodt, L. 2002. Speed-Is it Relevant? In Proceedings of the 21st South African Transport Conference Pretoria: CSIR.
- Masango, D. 2005. Zero tolerance for holiday drivers, Website available online from: www.southafrica.info/what_happening/news/arrivealive-220305.htm. 12 February 2009
- Mehmood, A., 2007. Understanding the Dynamics of Causal Factors related to Excessive Speeding Behavior of the Drivers, Website available online from: <http://systemdynamics.org/conferences/2007/proceed/papers/MEHMO512.pdf>
- Naidu, E. 2008. Food prices bite into your budget, Sunday Independent, 2 November 2008, Website available online from: http://www.iol.co.za/index.php?set_id=1&click_id=13&art_id=iol1228209139212P364.
- Social control Law, 10 June 2006, Website available online at: http://anthro.palomar.edu/control/con_2.htm.
- SHELL Price Change Forecast, Website available from: <http://www.shell.co.za/vpower/pprice.htm>. 5 February 2009.
- Steg, L. & Rothergatter, T. (ed) 2008. *Applied Social Psychology: Understanding and Managing Social Problems*. Chapter 1 Introduction to applied social psychology. University Press: Cambridge.
- Ragnoy, A. 2008. Lowering speed limits reduces speeds and saves lives in Norway. *Nordic Road and Transport Research* (2)
- Road Traffic Authority New South Wales Road User Behaviour Study Recommendations Summary Report. 2003, Website available from: <http://www.rta.nsw.gov.au/roadsafety/downloads/roaduserbehaviourstudy.pdf>. 2 December 2008.
- Road Traffic Management Corporation: Estimated Traffic: 2001, 2002 & 2003, Website <http://www.arrivealive.co.za>
- Road Traffic Management Corporation: Road Traffic and Fatal Crash Statistics 2003-2004. June 2005 (PDF), Website <http://www.arrivealive.co.za>

Road Traffic Management Corporation: Road Traffic Report March 2008. 17 April 2008. (PDF), Website <http://www.arrivealive.co.za>

Road Traffic Management Corporation: December 2005 Road Traffic Report. 10 January 2006. (PDF) Website <http://www.arrivealive.co.za>

Road Traffic Management Corporation: April 2006 Road Traffic Report. 13 May 2006 (PDF), Website <http://www.arrivealive.co.za>

Road Traffic Management Corporation: Interim Road Traffic and Fatal Crash Report for the year 2006. 26 January 2007(PDF), Website <http://www.arrivealive.co.za>

The Rand Today, Website <http://www.therandtoday.com/2008/03/02/petrol-price-rise-on-wednesday> 2 February 2009.

Van Schagen, I.N.L.G., 2008. Snelheid en Snelheidbeheersing. SWOV: Leidshendam.