

Economic Development Committee

Inquiry into the road safety benefits of fixed  
speed cameras

Submission 32



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# **Inquiry into the road safety benefits of fixed speed cameras**

**To:**

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# Inquiry into the road safety benefits of fixed speed cameras

## ***Fixed Speed Cameras In Queensland***

In 1997, when speed cameras were introduced, only 51 people died in crashes where speed was a contributing factor.<sup>1</sup> By 2009 when more speed cameras were used than ever before and fixed speed cameras had been operating since 2007, a total of 75 people died in crashes where speed was a contributory factor.<sup>2</sup>

This represents almost a 50% increase in deaths from the type of crash that speed cameras are supposed to prevent, not increase. Further, neither year could be described as a 'statistical glitch'. In that period, only 1998 qualifies for that description.

Accordingly fixed speed cameras and speed cameras generally have dramatically demonstrated a failure to improve safety.

Given the tragic consequences of speed cameras in Queensland, the fact that they were not introduced on a trial basis, and the failure to hold an enquiry into speed cameras generally we submit that, in the interests of public safety in Queensland, it is critical that our submission takes the liberty of including some reference to speed cameras generally when discussing the road safety implications of fixed speed cameras in particular. We therefore include mention of general speed cameras from time to time in the course of this paper. We submit that most observations that apply to speed cameras generally also apply to fixed speed cameras exclusively.

Laws and enforcement should not be an arbitrary imposition but instead should support the common good. Costs as well as benefits should be considered when retaining an enforcement method. In relation to traffic law, the primary purpose of rules, regulations and enforcement should be the safety of road users. However since the purpose of roads is mobility and speed relates to mobility the logical corollary is a trade off between mobility and safety when regulating speed.

Enforcement can promote safety by punishing dangerous behaviour but it can be undermined by punishing behaviours that are clearly not dangerous, neglecting to punish dangerous drivers, or employing or continuing with ineffectual or counterproductive enforcement measures.

Due to the obvious ineffectiveness of speed cameras in relation to improving safety, the cost to the Queensland public needs to be considered as this has significant ramifications for many of the people concerned, and may result in a further potentially protracted burden on public monies if the financial pressure destroys the self sufficiency of Queenslanders in borderline financial situations. It is difficult to know the exact cost to the public due to speeding fines from speed cameras but if fixed speed camera fines are estimated to be \$133 (minimum) then

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<sup>1</sup> Queensland Transport *Road Traffic Crashes in Queensland 1999* p37  
[http://www.transport.qld.gov.au/resources/file/ebff4f0892e4a4a/Pdf\\_rs\\_rtc\\_1999.pdf](http://www.transport.qld.gov.au/resources/file/ebff4f0892e4a4a/Pdf_rs_rtc_1999.pdf)

<sup>2</sup> Queensland Transport (2010) *Speeding*  
<http://www.transport.qld.gov.au/Home/Safety/Road/Speeding/>

in 2008 the Queensland public paid a minimum of \$9, 599, 674 based on the 72, 178 fixed speed camera infringements<sup>3</sup>.

That doesn't take into account mobile speed camera fines and is clearly an underestimate. The overall speeding fine cost was \$123.60million<sup>4</sup> but this includes enforcement by police officers most of which would assumedly be directed at improving safety. It also fails to account for the economic consequences and personal consequences of the extra deaths. The damage to public confidence in road safety measures and its potential to hamper genuine road safety measures is immeasurable. Even the Queensland police are getting disillusioned recognizing that increasing speed camera use would be revenue raising<sup>5</sup>. This is not the first time that they have made a public comment. In 2003 a police officer appeared on Channel 9 asserting that speed cameras have done nothing to save lives on Queensland Roads.<sup>6</sup>

## ***The Effectiveness Of Fixed Speed Cameras In Reducing Speeding And Road Trauma***

### **Ineffective in reducing road trauma**

Year	Speed Related Fatalities	Total Fatalities	Percentage
1997	51	360	14
2004	52	311	17
2009	75	333	22.5

**Table 1 - Speed Related Fatalities - Selected Years**

Queensland Transport's collection of data clearly indicates that speed cameras do not work. It is an inescapable conclusion from the data. In 1997 when speed cameras were introduced speed contributed to 51 fatal crashes. This has increased with increasing speed cameras. By 2004, (the most recent year for which Queensland Transport's annual road crash statistical publication has been produced) there were 52 such fatal crashes. In 2007 fixed speed cameras were introduced. In 2009 speed was a contributing factor in 75 fatalities.

Speed cameras cannot reduce the incidence of any of the various factors contributing to road deaths other than speed. Thus the increasing incidence of deaths with speed as a contributing factor with the increased usage of speed cameras, whether mobile or fixed, clearly demonstrates their ineffectiveness in improving safety. As the remaining portion of the road toll has not increased in proportion it indicates that if speeding enforcement was equally effective as it was in 1997 the road toll would be significantly lower.

Anomalously research has been produced indicating the effectiveness of speed cameras in spite of the above reality check. The question needs to be asked how the research can be so inaccurate. One possibility is the use of Transport Department commissioned research which is then considered to be independent. The substantive independence is, as a matter of common sense, questionable given the commissioning body's commitment to speed enforcement and

<sup>3</sup> Moorehead E (March 2010) Fixed speed camera inquiry considers excessive monitoring of Queensland's roads, Economic Development Committee Media Release.

<sup>4</sup> Ironside R. (2010) Speedsters pour money into state coffers The Courier Mail <http://www.couriermail.com.au/news/features/speedsters-pour-money-into-state-coffers/story-e6freoz6-1225858529763>

<sup>5</sup> Poyhonen, N. (2010) *More speed cameras is just 'revenue raising'*: QPU ABC News 1 March 2010 <http://www.abc.net.au/news/stories/2010/03/01/2833458.htm>

<sup>6</sup> Queensland Parliament (2003) Hansard 1 May 2003 p 1555

speed cameras. Without in any way accusing research organizations both in Australia and in some cases overseas of deliberately producing results that suit the body commissioning the research it stands to reason that there would be difficulty avoiding the bias when those paying for the research are so resolute in their views. A dramatic example where such “independent research” was compromised is demonstrated with regard to Monash University Accident Research Unit’s evaluation of Queensland Transport’s random road watch program.<sup>7</sup>

The Travelsafe Committee reviewer, Dr Andreassen Ph.D., evaluated this. Dr Andreassen has an undergraduate science degree, masters’ degrees in engineering and engineering science. His expertise is relevantly in accident data systems, traffic engineering and safety investigations, accident data interpretation and analysis, statistical analysis and cost benefit analysis. At Page 20 the reviewer is reported to have determined in relation to MUARC’s evaluation that:

“The combining of significant and non-significant results in different regions, overstates the reductions due to RRW”

As regards the specific issue of independence the report notes at Pages 27- 28:

“90. One of the documents the department provided the committee in support of its statistical methodologies, a report by MUARC from its “independent” evaluation of the department’s Random Road Watch program, has since been revised and published by the university. The revised report lists Queensland Transport’s Dr Mark Leggett, the architect of the Random Road Watch program, as co-author.

91. Dr Leggett also prepared the department’s brief to engage consultants for the review, and was a primary contact used by MUARC for information required for the review. The committee suggests that Dr Leggett’s multiple roles as architect of the Random Road Watch program, organiser of the consultancy for the program’s review, primary contact person for the consultants’ information requests for the review and co-authorship of the published evaluation report threaten the independence of the review by MUARC.

92. There are well-established parameters for independence in evaluations. Notably, on the subject of evaluator–client relations, a different MUARC report notes:

Communication during the evaluation is also important, although the temptation on the part of the client to suggest strategies which direct the study towards a particular conclusion should be avoided. For this reason it is necessary to keep a distance between the evaluator and the client.

93. The committee suggests that Dr Leggett’s role in the evaluation may not have afforded adequate “distance between the evaluator and the client” and may, therefore, compromise the independence of the MUARC review.”

Likewise the possibility should be considered that, in similar circumstances, other research put forward may also inadvertently end up overstating the benefits of an intervention. Not only has such recent research on speed and crashes yielded anomalous results in that they are inconsistent with the decades of prior research but other anomalies have occurred in the “speed kills” culture.

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<sup>7</sup> Parliamentary Travelsafe Committee (2000) Report on Queensland Transport’s Road Safety Statistical Methodologies. Report 32  
<http://www.parliament.qld.gov.au/TSAFE/view/historical/documents/committees/TSAFE/reports/tsr032.pdf>

When 50kph speed limits were introduced in Queensland braking distances experienced massive inexplicable increases. At 60kph stopping distance increased from 33m to 56m. It remains at 56m to this day. (before<sup>8</sup> and after<sup>9</sup>)

By contrast, Wheels magazine drivers can stop any car travelling at 90kph in under 50m (Wheels Yearbook 2002, P10.) and British drivers apparently manage to stop from 64kph (40mph) in 36m.<sup>10</sup>

The ineffectiveness of speed cameras in improving safety and their failure to live up to well publicized expectations and claims, could create a natural tendency to attempt to be overly diplomatic with regard to research into and reporting of embarrassing outcomes.<sup>11 12</sup>

### Failed to meet expectation

Speed cameras were introduced on the basis that they would reduce fatalities and reduce the incidence of speeding offences through deterring driving above the speed limit. They have failed on both counts and this has been more noticeable since the introduction of fixed speed cameras. The failure to reduce fatalities with speed as a contributing factor over an extended period has already been discussed. The failure to deter offenders can also easily be established.

This year Queensland Transport advised that 1800 people are caught speeding each day<sup>13</sup>. That equates to 657,000 tickets per annum. In the calendar year 1993/94, only 190,755 traffic offence notices were issued for speeding<sup>14</sup>.

Clearly, more efficient detection could account for some of the increase but equally clearly the phenomenal increase demonstrates that the introduction of speed cameras including fixed speed cameras has not reduced incidence of exceeding the speed limit.

Indeed surveys not commissioned by Transport Departments typically find results such as 84 per cent of drivers **admitting** to exceed limit at least some of the time.<sup>15</sup>

This is in the context of constant publicity advising that exceeding the speed limit is dangerous and may thus be understating the extent. There is likely to be at least 2,761,200 (number in 2004) registered vehicles.<sup>16</sup>

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8 Queensland Transport (1998) *The Effects of Speed*

<http://www.aussiemotorists.com/braking/index.htm#1999>

9 Queensland Transport (2009) Stopping Distances

[http://www.transport.qld.gov.au/Home/Safety/Road/Speeding/Speeding\\_stopping\\_distances](http://www.transport.qld.gov.au/Home/Safety/Road/Speeding/Speeding_stopping_distances)

10 <http://www.stoppingdistances.org.uk/results/40dm.htm> (click on "Run the Simulator" button near top left)

11 theNewspaper.com (2009) UK Statistics Authority Blasts Bogus Speed Camera Data

<http://thenewspaper.com/news/28/2851.asp>

12 theNewspaper.com (2008) UK Parliament Slams Bogus Speed Camera Statistics

<http://www.thenewspaper.com/news/26/2638.asp>

13 Queensland Transport (2010) Fixed speed camera fact sheet February 2010

<http://www.docslot.com/docs/29822331/Fixed-speed-camera-fact-sheet--February-2010/>

14 Parliamentary Travelsafe Committee (1994) Speed Cameras: Should they be used in Queensland?, Report 15

<http://www.parliament.qld.gov.au/TSAFE/view/historical/documents/committees/TSAFE/reports/tsafe15.pdf>

15 AAMI (2009) Crash Index Annual Road Safety Index

<http://www.aami.com.au/Resources/File.aspx?id=158>

16 Department of Transport and Main Roads (2009) 2004 Road Traffic Crashes in Queensland p6

[http://www.transport.qld.gov.au/resources/file/eb9d8807806347c/Pdf\\_stats\\_road\\_traffic\\_crashes\\_in\\_queensland\\_2004.pdf](http://www.transport.qld.gov.au/resources/file/eb9d8807806347c/Pdf_stats_road_traffic_crashes_in_queensland_2004.pdf)

If there is for example one driver for each of them then that would mean that 2,319,408 incidents of speeding “some of the time”. Acknowledging the imprecision in the estimate it is nevertheless valuable to compare it with the 75 people who died in crashes where speed was a contributing factor in 2009, including the ones that can be attributed to known dangerous driving and known police chases, those where alcohol was also a contributing factor, and presumably ones where a youthful male suicides by lining up a solid object at speed. The estimation is rough but it nevertheless serves as a sobering reality check when all speeding is considered to be dangerous.

Although this indicates that most people exceed the speed limit without reducing safety, speed is nevertheless a factor in road deaths that needs addressing and the failure of speed cameras to address the relevant crashes can only be described as a tragic disaster.

## **Possible Mistaken Assumptions That Resulted In Use Of Mobile And Fixed Speed Cameras**

At the time of introduction, speed cameras could reasonably have been expected to meet objectives. The following would reasonably appear to have been advantages when the introduction was being contemplated and possible reasons each assumption may have failed are included with them.

1. Increase in detection leading to increase in deterrence. In a tunnel with two speed cameras for a journey that takes 6 minutes to travel 10kph below the speed limit this might work (ie. Clem 7) or most drivers might choose to avoid it. However as a general proposition this may not work as it fails to account for three things:
  - (a) **Basic human nature.** The personal experience of being apprehended by a police officer is incomparable with receiving another bill in the mail. Further, some people make genuine mistakes and can benefit from a discussion with a police officer with no ticket resulting (eg. identifying that they don't check signs with sufficient regularity). The result is goodwill and a driver motivated to be more careful. Speed cameras ask no questions and drivers can feel unfairly treated and used as a cash cow. Subsequently, they don't avoid the source of their error but instead look out for speed cameras.
  - (b) **The well documented resistance of drivers to attempts to deter them from driving at or close to the 85<sup>th</sup> percentile.** This will be discussed in detail in the next section (Speed And Crashes – Are Fundamental Assumptions etc) of this submission paper. Speed reviews were conducted between 1996 and 1997 and some speed limit adjustments resulted. You are invited to investigate to what extent speed reviews were conducted on the Queensland road network, whether they were conducted independently and whether reasonable criteria such as a set number of seconds of free travel space preceding the vehicle being measured and painstakingly covert measurement were used, and whether resulting adjustments to speed limits corresponded to the 85<sup>th</sup> percentile speed of free flowing traffic. Our position is that speed reviews did not result in the entire network obtaining scientifically valid limits.
  - (c) **It is a ubiquitous human weakness to fail to *connect the dots* when action and consequences become separated.** Were that not the case, credit card companies would go bankrupt overnight. Automated enforcement creates a barrier between action and consequence. (We understand that speed camera



notices are currently received more than two weeks after the alleged infringement when the driver has forgotten about it).

2. Speed cameras can be highly visible thus increasing the perceived risk of apprehension. The increasingly covert nature of speed cameras required to apprehend offenders will always necessarily mitigate against this effect.
3. Transport department commissioned research indicated that speed cameras improved road safety in other jurisdictions. See pages 2 and 3 above for a discussion of the difficulties of obtaining objective substantively independent research when a body committed to a measure commissions research in relation to that measure.
4. Large numbers of offenders can theoretically be detected in close proximity. This fails to account for the 85<sup>th</sup> percentile rule that is based on the reality that most drivers drive at reasonable speeds. There is no need to detect a multitude of drivers in close proximity if it does not benefit safety. Only a minority of drivers need to be selected for punishment. Exceeding that threshold with overly pedantic enforcement only exacerbates the perception that enforcement is revenue based rather than safety based and leads to contempt for both laws and enforcement.
5. Surveys commissioned by Transport authorities indicating that 80% of Victorian motorists support the use of speed cameras suggested that Queensland motorists would not view speed cameras as an Orwellian revenue generating device.<sup>17</sup>

Again the discussion on pages 2 and 3 regarding commissioned research applies. Further, surveys are particularly vulnerable to obtaining results that reflect the bias of those developing the questions rather than the respondents. For a comical illustration of this see this video:<sup>18</sup>

Opinion polls not commissioned by Transport Departments in fact indicate that Victorians overwhelmingly (60%) see speed cameras as simply revenue raisers.<sup>19</sup>

6. Using speed cameras in conjunction with speeding campaigns might finally convince people to stick to the speed limit. The ineffectiveness of speeding campaigns in reducing breaches of laws is dramatic compared with drunk driving and seat belt campaigns of the 1970s. If it is assumed that the desired behaviour change improves safety and the resistance is due to an immunization effect, as people are more likely to have inadvertently exceeded the speed limit and not crashed, then a new approach might be needed and speed cameras might work. However, surely some of the gains from prior campaigns for drink driving and seat belt usage must have included people who had not crashed, but nevertheless changed as a result of the campaigns. These assumptions would fail if most drivers exceeding speed limits were actually driving at a reasonable speed and that is manifestly obvious to them.

In Victoria in 1997, 96% of drivers wore seatbelts but 20% of car occupants killed were not wearing seat belts.<sup>20</sup>

By comparison consider the rate of speeding compared to speeding related deaths on page 5 above. There is a dramatic difference.

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<sup>17</sup> VicRoads (1991). Attitudes to Speed—Wave Four, Report 1 Summary of Results. Published in August 1991.

<sup>18</sup> <http://www.youtube.com/watch?v=2yhN1IDLQjo>

<sup>19</sup> Moore K (25 January 2010) Speed cameras no deterrent to young Herald Sun <http://www.heraldsun.com.au/news/special-reports/speed-cameras-no-deterrent-to-young/story-fn4ut938-1225823097804>

<sup>20</sup> Vicroads (1998) Road Accident Facts 1997 Edition Vicroads.

Even if a particular example contradicts the current road safety fraternity's subcultural beliefs and makes low risk of exceeding the speed limit exaggeratedly clear, road safety experts don't appear to be receptive. In the 1998 National Road Safety Summit a panel expert participating in a hypothetical, Jerry Moller, dismissed improved driver training as a countermeasure citing the example that racing car drivers have the worst driving records "in terms of speeding because they think they can do things".<sup>21</sup>

For the rest of us the observation is baffling. In reality there is good reason for race car drivers to think that they can "do things". Racing car drivers can "do things" and do "do things" very well indeed at speeds that eclipse the requirements for getting a blemish on their traffic history for minor speeding. Investigations of their reaction times also indicate that they have unusually quick reaction times. What if this is an incorrect presumption that certain drivers can't tell when their speed is reasonable is also applied to other drivers?

Likewise, road safety researchers sometimes elicit attitudes from drivers that they assume are rationalizations but instead align with reliable scientific findings. For example Susan Stancombe advised that "There is always a 'good excuse' to exceed the limit" (sarcasm was palpable) and advised that drivers "...justified speeding in many ways (eg. keeping up with the flow of traffic)."<sup>22</sup>

(see Cirillo quote on p11 for an explanation why the supposed rationalisation is rather an insightful explanation consistent with solid research).

Further, even if the presumptions were correct it might indicate an insurmountable resistance and expending resources on less resistant behaviours might be a more feasible intervention at least until the less resistance behaviours were vastly reduced.

7. The slower the crash the less severe the crash. Therefore it is assumed that more enforcement will result in slower driving and less severe crashes and thus fewer deaths. Higher travelling speeds are also believed to result in longer reaction distances based on calculations of distance travelled during the assumed reaction time and much longer braking distances in an emergency situation. In accordance with these premises the goal becomes reducing travelling speed as a logical corollary for improving safety and there was no reason to doubt that speed cameras could assist. Explaining why these premises may not be correct requires a more comprehensive response and the next section is accordingly devoted to addressing this issue.

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<sup>21</sup> Moller J (1998) *verbal comment during the hypothetical on reducing road deaths* Federal Office of Road Safety National Road Safety Summit

<sup>22</sup> Stancombe S (1998) *Road Safety Attitudes and Concerns of Specific Target Groups* Federal Office of Road Safety National Road Safety Summit

## Speed And Crashes – Are Fundamental Assumptions Underlying Speed Camera Usage Warranted?

The relationship between travelling speed and crash involvement has been considered hard to demonstrate.<sup>23 24</sup>

It is basic physics that objects moving in relatively the same direction in close proximity are more likely to collide as the variance between the speed they are moving increases. But for steering and human reactions coordinating traffic speed would be mandatory to prevent absolute carnage. It can be reasonably speculated that a human behind the wheel needing to react to uncoordinated traffic speeds may not react perfectly and the result may be a collision with another car nearby, or with the surrounding environment.

Interestingly, more complicated physics produced by a nuclear physicist who turned his mind to the situation found that in theory going much faster or slower than the surrounding traffic increased crash risk.<sup>25</sup> His mathematical equations result in a prediction that meets with real life research findings.

A linear relationship between speed and crash risk has long been implied by information relating to crash risk provided to the Queensland public (eg. braking distance graphs). However the robust and well replicated findings of Solomon indicated a curvilinear relationship between speed and crash risk with drivers going much faster than the flow of traffic and drivers going much slower than the flow of traffic having the highest risk. Solomon compared data on the speed of 10,000 crashes with 290,000 drivers not in crashes.<sup>26</sup> It is probably uncontroversial to point out that prior to the 1990s any study with a contrary finding was revealed to be hopelessly methodologically flawed when peer reviewed.

It is noteworthy that the Solomon study was widely influential. Indeed the 1979 imposition of absolute speed limits in New South Wales was to produce a narrower range of speed in order to reduce crashes.<sup>27</sup>

Clearly if choosing a reasonable speed isn't almost as basic as steering in the correct direction or if drivers have a death wish or want to seriously harm other people Solomon's findings would be anomalous. The former has been studied in the Taylor study. The latter can be inferred to be incorrect from people's behaviour out of cars other than a tiny minority who generally act anti-socially and could benefit the most from enforcement. UK researcher Taylor had drivers drive a predetermined route through a variety of driving environments. Although driving speed was tangential to the aim of the research Taylor measured speeds. He determined

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<sup>23</sup> Cowley, J.E., (1980). "A review of rural speed limits in Australia". J.E. Cowley & Associates, Melbourne. Report CR 20. Prepared for Office of Road Safety, Department of Transport, Canberra

<sup>24</sup> Cameron, M., Cavallo A. & Gilbert A. (1992) "Crash-based Evaluation of the Speed Camera Program in Victoria 1990-1991. Phase 1: General effects. Phase 2: Effects of program mechanisms" Report 42. Monash University Accident Research Centre

<sup>25</sup> Kuznetsov A. (1996) A mathematical analysis of 'speed kills' arguments. Internet Article on Reasonable Drivers Unanimous Internet site.

<http://www.ibiblio.org/rdu/speedsci.html>

<sup>26</sup> Solomon, D., (1964). *Accidents on main rural highways related to speed, driver and vehicle*. Bureau of Public Roads, US Department of Commerce, Washington.

<sup>27</sup> Staysafe Parliament of New South Wales Joint Standing Committee on Road Safety (1987) *Staysafe 9: Safe Speed and Overtaking on 100km/h Roads* Discussion Paper p6

the accident rates for the past two years from police records and found that drivers slowed down in areas where many crashes occurred.<sup>28</sup>

Also relevant is research suggesting that driving too slowly may slow reactions to a sudden emergency. Even when coordinating speeds is a non issue, a driver travelling too slowly, or drivers of coordinated cars driving too slowly may be mentally out to lunch **when quick responses are needed to change a fatal crash situation to a near miss.**

Researchers Hal Weinberg PhD and Michael Gaetz from the brain behaviour laboratory at Charles Fraser University British Columbia Canada advised that some laboratory research indicates that people perform better at higher speeds in relation to attention and control of complex activities. Naturally the advantage is lost after a certain speed when the brain becomes overloaded due to the high speed. Drivers are more likely to engage in the driving task automatically and focus attention elsewhere at slow speeds and “If events are changing very slowly but something happens suddenly, requiring an immediate response, the brain may react less efficiently than if events had already been changing more rapidly”<sup>29</sup>

As the Taylor study did not attract the attention of road safety researchers, by at least the 1980s the Solomon study was viewed with suspicion. Accordingly, a common approach at the time was to acknowledge the failure of research to establish increased crash risk with increasing speed with a hint of expectation that understanding would improve and to move on to a discussion of crash severity with crash speed. This discussion topic was often described as “basic physics” and an inference drawn that danger was proportionate to driving speed. The possibility that most drivers might slow down in dangerous areas and speed up in safer areas or that driving too slowly may slow down response to emergency situations thus rendering the momentum issue moot was not considered.

Dwelling only on crash severity and crash speed is a fundamentally flawed approach analogous to discussing only whether dynamite is better to be hammered with less force or more force. In both cases no impact means no dangerous force. A force inflicted on a vehicle is reasonably likely to be transmitted to the occupant. In other words crashing harder does more damage than crashing softer but **crash risk is the key** as not crashing at all means no damage.

That is not to say that improvements in occupancy protection are not worthwhile. They too are extremely valuable because they do not increase crash risk, unlike driving too slowly. That is also not to say that reducing travelling speed to 10kph would not vastly improve safety irrespective of whether or not drivers are mentally out to lunch. However, as the purpose is mobility and driving at little more than walking speed would defeat that purpose, a trade-off is accepted. Thus driving at significant speeds is assumed and crash risk becomes paramount.

In 1995, researchers in South Australia in a small study found a significantly elevated crash risk for drivers going more than 75kph in a 60kph zone without a commensurate risk for drivers going slowly.<sup>30</sup>

Then in 1997 some South Australian researchers produced an extremely well publicised (but nevertheless widely criticised) study which indicated that driving only slightly faster than

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<sup>28</sup> Taylor, DH (1964) Drivers Galvanic Skin Response and Risk of Accident. *Ergonomics* 7, 439-451.

<sup>29</sup> Weinberg H and Gaetz M (1996) *Brain Limits*. Recovery 7:2

<http://web.archive.org/web/20031216013135/http://www.icbc.com/Library/recovery/Volume7/Number2/BrainLimits/index.html>

<sup>30</sup> Moore VM, Dolinis J, Woodward AJ. (1995). *Vehicle speed and risk of a severe crash*. *Epidemiology*; 6(3): 258-62.

average (they construed this as faster than the speed limit) was dangerous. The study looked at a small sample of crashes (148 selected from 952 crashes. Most were eliminated pursuant to the researchers' criteria aimed at getting pure data on the relevant relationship but 99 crashes were eliminated solely because there was insufficient information for crash reconstruction). They found both a dramatic increase in crash risk with going 5kph or more above the average speed (which coincided with and they described as the speed limit) and no detriment to safety going below the average speed (other than at 40kph). The average speed of the control vehicles passing the accident locations was only approximately 60kph.<sup>31</sup>

This raises the issue of the representativeness of the crash sites as 60kph zones. The accident sites seem more properly characterized as places in 60kph zones where traffic moves unusually slowly rather than typical examples of 60kph zones.

A later reanalysis of the data by Lambert (former Manager of Road Safety Research at VicRoads), found that it supported a curvilinear relationship and pointed out that the speed limit involved (60kph) was confused with the average speed in that the increased risk was associated with driving above the average speed. In Victoria average speeds in 60kph zones have been measured at 65-67kph. Therefore, in typical 60kph zones, to get the crash risk attributed to 5kph above the speed limit would require a driving speed of up to 72kph which would be 12kph above the speed limit.<sup>32</sup>

Therefore, ironically, the apparently ground breaking 1997 study is considered by some to be consistent with Solomon's research and the atypically low average speeds at the crash sites is consistent with Taylor's research showing that people drive slowly at dangerous locations.

The obvious question unanswered is: **Does risk increase as quickly in more typical examples of 60kph zones?** A reality check answering this was provided courtesy of comparisons undertaken by the original researchers but seldom discussed by people who propagate their risk findings for obvious reasons. The crash risk at 5kph above the 'speed limit' equated in risk to a Blood Alcohol Concentration of 0.05 and the risk at 10kph above equated to a Blood Alcohol Concentration of 0.1.

The logical corollary is that either this isn't the risk drivers normally encounter when exceeding the speed limit or over 2 million drunks on the road would only result in 75 deaths – a possibility that sounds extremely unlikely.

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<sup>31</sup> Kloeden, C.N., McLean A.J., Moore V.M., and Ponte G (1997) "*Travelling Speed and Risk of Crash Involvement*" research report by -NHMRC Road Accident Research Unit on behalf of the Federal Office of Road Safety

<sup>32</sup> Lambert J. (1998) *Does the crash rate really double for every 5kph over a 60kph limit?* Conference Paper presented at Road Safety Research, Policing and Education Conference  
<http://www.rsconference.com/roadsafety/detail/265?check=1>

Accordingly, drivers should be encouraged to drive with the flow.

“Chairman Armbruster and members of the Senate Highways and Transportation Committee, thank you for allowing me to testify before your committee. My name is Julie Anna Cirillo. The topic under consideration is one that I have focused on for almost my entire professional career. I recently retired from the United States Department of Transportation (DOT) where I was the Assistant Administrator and Chief Safety Officer for the Federal Motor Carrier Safety Administration. I worked for the DOT for 34 years. The first 31 of these years were spent with the Federal Highway Administration (FHWA) and its predecessor agencies where I was a safety researcher and ultimately the Regional Administrator in Region 9, San Francisco.

I have an undergraduate degree in Mathematics and Physics and a Masters degree in Transportation Engineering. I have chaired and served on several committees for the National Academy of Sciences’ Transportation Research Board and the Institute of Transportation Engineers. I have received a number of awards and honors including the Secretary’s Gold and Silver Medal and the Presidential Meritorious Service Performance Award...

Over the years particularly during and following the energy crisis in 1972-73, the issue of speed limits, operating speeds, and safety has remained controversial and many studies conducted by a variety of organizations including the Transportation Research Board have tried to finally put the issue to rest. During all this activity and up to the present time there has been no evidence to alter Solomon’s original finding that variance from the mean operating speed is a major contributor to accidents. In fact, many safety organizations and states, including Ohio, advise drivers to “drive with the flow of traffic”...

In summary, traffic operating at or about the same speed, regardless of speed limit, is the safest traffic environment. Jurisdictions should do whatever they can to encourage this operating scenario and should never require the opposite. ”

Cirillo J.A. (2003) Testimony. Senate Bill 94 - Before the Senate Highways and Transportation Committee<sup>33</sup>

The fact that most people drive at a reasonable speed responsive to conditions and that coordinating with the flow of traffic improves safety enables a scientific approach to setting speed limits. It is certainly arguable that there is a case for a more scientific approach to the selection of speed limits.<sup>34</sup>

The scientific approach (correctly) referred to by the Committee requires that speed limits are set in accordance with the speed that 85% of drivers would choose to travel. This is often referred to as the 85<sup>th</sup> percentile rule.<sup>35</sup>

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<sup>33</sup> Cirillo J.A. (2003) Testimony. Senate Bill 94 - Before the Senate Highways and Transportation Committee

[http://web.archive.org/web/20061016054102/http://www.ooida.com/straight\\_talk/Cirillo\\_Testimony.htm](http://web.archive.org/web/20061016054102/http://www.ooida.com/straight_talk/Cirillo_Testimony.htm)

<sup>34</sup> Travelsafe Committee (1991) Report of the Travelsafe Committee into Road Safety Education and Traffic Law Enforcement Report No. 3 Legislative Assembly Queensland p9

<http://www.parliament.qld.gov.au/TSAFE/view/historical/documents/committees/TSAFE/reports/tsafe3.pdf>

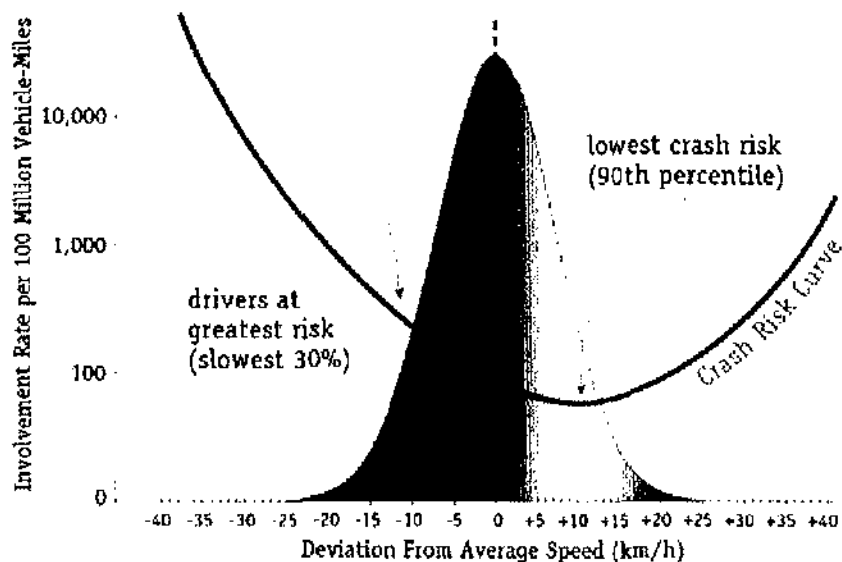
<sup>35</sup> Kirkland Transportation Commission (undated) *Speed limit policies from other agencies* Kirkland City Council Washington Page 1

<http://www.ci.kirkland.wa.us/Assets/Public+Works/Public+Works+PDFs/transcom/archive/Speed+Limit+Policies+-+Other+Agencies.pdf>

A correctly set speed limit is the best option for safety based enforcement since it is a speed most drivers want to drive at. Thus perceptions of unfairness are minimized. It is also an uphill battle to get drivers to commit to go slower.

We recommend that the previous Parliamentary Committee recommendations are revisited and a more thorough and ongoing attempt is made to adopt the 85<sup>th</sup> percentile speed limits in order to maximize the benefit and efficiency of speed enforcement. **The 85<sup>th</sup> percentile method is the internationally accepted method of setting speed limits.**

Australian research papers have sometimes speculated that 85<sup>th</sup> percentile research may not apply in Australian conditions because it was all conducted overseas. That is incorrect.



**Figure 1 Solomon graph adapted to km/h by SENSE**

**SENSE** © 1996-2007

## ***The Criteria Used To Select Sites For Fixed Speed Cameras***

As argued above, NMAA do not believe that fixed speed cameras should be used. If they were to be used, the best option would be a temporary location at blackspots pending engineering improvements. The required solution is to correct the design of that section of road that is causing the accident blackspot to exist.

## ***The Most Efficient Use Of Resources To Maximise The Safety Benefits Of Fixed Speed Cameras***

There are no safety benefits.

## ***The Impact Of New Technologies On Fixed Speed Cameras***

### **GPS Equipment**

GPS navigational equipment can alert drivers to the location of speed cameras and risk taking inappropriate speeders can engage in risk taking elsewhere at locations with reduced prospect of apprehension. If fixed speed cameras are located on motorways the speed risk migration may be to roads less forgiving of speed thus increasing the hazard.

### **Digital image security**

At the time of speed cameras first introduction, the public was reassured that wet film technology provided some safeguard against manipulation of images. Recent moves to adopt digital technology have occurred but the question of image security against manipulation has remained unaddressed.

### **Combined Speed and Red Light Cameras**

Improved camera technology allows dual purpose cameras, with combined speed and red light cameras. However, international studies have shown that engineering improvements are far more effective than red light cameras and without the expenditure. For example, better engineering of traffic light signal times almost halves red light violations simply by increasing the amber period by a few tenths of a second.

#### **Texas Transportation Institute Study: Longer Yellows Reduce Crashes**

*The Texas Transportation Institute shows that engineering improvements are an effective alternative to cameras.*<sup>36</sup>

The Texas Transportation Institute examined concerns that red light cameras were being used by cities that had not first exhausted available engineering alternatives such as improving signal timing and visibility. They studied individual police accident reports from 181 intersection approaches across three Texas cities over three years to determine the most

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<sup>36</sup> Texas Transportation Institute (9/1/2004) *Development of Guidelines for Treating Red-Light Running*  
See also: <http://www.insurancejournal.com/news/newswire/midwest/2003/06/10/29673.htm>



effective solutions for problem intersections.

The study found that improving signal visibility reduced violations 25 percent. Other changes could net between 18 and 48 percent reductions. Yet they found when the yellow signal was 1 second shorter than what the standard ITE timing formula specifies as a minimum, red light violations jumped 110%. Adding an additional second to the ITE minimum yellow yielded 53% reduction in violations, producing the greatest benefit of all the factors studied (2-6). When safety is the main concern, preventing crashes is more important than reducing violations. Yellow signal timing again proved most effective in reducing crashes. An extra second yielded a 40 percent collision reduction. Many people need sufficient time to accommodate light changes not a ticket in the mail after a crash.

The study also found that the vast majority of red light camera tickets are issued within the first second a light is red -- in fact, the average ticket is issued when the light has been red for half a second or less. Yet right-angle crashes, which account for the majority of red-light related collisions, "with one exception, all of the right-angle crashes occurred after 5 seconds or more of red" (5-16). In other words, tickets are being issued primarily for split-second violations where collisions are not occurring.

### **Key Statistics:**

*The data in figure 2-11 indicate that there is a trend toward fewer red-light related crashes when the observed yellow is longer than the computed duration. (2-22)*

*An increase in yellow duration of 1.0s is associated with an MF [crash frequency] of about 0.6, which corresponds to a 40 percent reduction in crashes. (2-20)*

Red light cameras rate poorly as a road safety tool. The American Automobile Association has promoted better engineering at arterial road intersections which has reduced fatalities. It has shown that simple changes such as a separate lane for left hand turns make significant improvements in road safety (in Australia, it would be a separate lane for right hand turns). Source: <http://www.aaafits.org/pdf/NovDec99.pdf>

## ***The Appropriate Role Of Fixed Speed Cameras In The Overall Speed Enforcement Regime***

Speed cameras long term association with increases in the relevant category of road deaths means that they have no place in the overall speed enforcement regime.

Proponents of fixed speed cameras hold that they have a place in blackspots that are difficult to otherwise enforce. However identified blackspots should be the subject of engineering improvements not measures that could very generously be described as a 'band aid' solution given the history of their usage being associated with increasing road deaths.

Not only is their use unwise but they have disadvantages that enforcement by police does not create. These are:

1. Very limited enforcement. They typically measure only one behaviour and at best measure two. Police are able to detect a number of dangerous behaviours and sometimes locate criminal activity in the process. A drunk driving at the speed limit past a speed camera could then kill someone without detection.

2. People receive tickets in the mail. This was previously by registered post but we understand that it is now by general mail. If the ticket is not received, the would-be recipient is disadvantaged by the failure of notification.
3. A delay in notification results in both less deterrence and less opportunity for the accused to know if the allegation is correct as they cannot necessarily recall all details and in some cases may not even know whether or not they were the driver.
4. Infringement notices are associated with a significant penalty and a blemish on the record yet the legal right of venerable antiquity to test the evidence of the accuser is lost. For fixed speed cameras a machine cannot be cross examined.
5. In the case of company owned vehicles, there is the possibility of nominating an unknown driver and simply paying a higher fine. The real offender is never punished.

If Queensland were to remove this obstacle to road safety it would not be an unprecedented move. In the United States of America 15 states and 9 cities have banned automatic enforcement.<sup>37</sup>

## ***Other Relevant Factors***

### **CAMERAS and the OVER-EMPHASIS ON SPEED**

We need far better management of road safety if there is to be a sustained reduction of road fatality ratios below the 1998 level. Road safety education overly emphasizes speed and deprives people of the opportunity to properly consider other causes of road fatalities. Given that cameras have proved to be so detrimental to safety continued usage will only reinforce the belief that speeding fines are just a tax on motorists. The state government focus should not be solely on speed and the associated revenue. Instead, the focus should be on reducing road fatalities and injuries.

The concept of the "scientific infallibility" of speed cameras has been disproven. Governments in other states have admitted this. Infallibility is a religious doctrine not a principle of electrical engineering. Fixed speed cameras are designed to detect faults but performing with absolute precision is impossible for a machine – particularly one continually exposed to the elements. The nature of this machine is such that performing perfectly is particularly challenging. A tiny electronic fault could have a significant effect on speed reading.

Fines totalling \$18 million were refunded to the 87,000 drivers caught by 19 faulty cameras in Victoria.<sup>38</sup>

An internal government audit revealed hundreds of fines had to be refunded in South Australia.

In NSW, during February this year (2010) the RTA announced that \$143,000 in fines would be refunded due to the Pittwater Road camera, in a school zone, recording incorrect speeds.<sup>39</sup>

Tunnel mounted speed camera fines had to be refunded.<sup>40</sup>

<sup>37</sup> [theNewspaper.com](http://thenewspaper.com) (2009) *Fifteen States, Nine Cities Where Automated Ticketing is Banned*  
<http://thenewspaper.com/news/27/2769.asp>

<sup>38</sup> Bracks S (2004) *Government Acts on Speed Cameras* Media Release from the office of the Premier (Victoria)  
[http://www.dpc.vic.gov.au/domino/Web\\_Notes/newmedia.nsf/bc348d5912436a9cca256cfc0082d800/b09a2be3644a6cc1ca256e96007da1f1](http://www.dpc.vic.gov.au/domino/Web_Notes/newmedia.nsf/bc348d5912436a9cca256cfc0082d800/b09a2be3644a6cc1ca256e96007da1f1)

<sup>39</sup> Bodkin P. (2010) *Speed fines refund after faulty camera find* The Manly Daily  
<http://manly-daily.wherelive.com.au/news/story/spped-fines-refund-after-faulty-camera-find1/>

<sup>40</sup> Bissett K. (2008) *Courts quash roadwork speed fines* The Daily Telegraph

The RTA was ordered to refund 4,915 fines from a King Georges Road speed camera.<sup>41</sup>

Often these situations eventuate from a major fault being identified. A smaller intermittent fault would result in countless innocent drivers being fined and disillusioned without the fault being detected.

Speed camera faults are an international problem. Clearly this undermines public confidence.<sup>42</sup>  
43 44 45

Speed cameras have become a blight in Australia. For example, there are more cameras than accident blackspots in NSW. Sometimes they are known to cause accidents.<sup>46 47</sup>

The NMAA is deeply concerned that people are imbued with the belief that "as long as you stick to the speed limit you are safe". We believe it is far better to have responsible drivers who are engaged in their driving and constantly evaluating their speed, among other aspects of their driving, rather than a fleet of mindless drones focussed on their speedometers. There is no one single measure of safe driving - road safety cannot be measured in kilometres per hour as the organisation *Safe Speed* are fond of writing.

## VISIBLE POLICE PRESENCE

One issue that most road safety groups agree on is that the most effective means of improving driver behaviour on the roads is via marked police vehicles patrolling the roads. Their mission should be the enforcement of all of the road rules, consistently, every day and night of the year. Selectively enforcing one or two road rules is ineffective. In particular, selectively focusing on speed has proven to not reduce road fatalities in Queensland since 1998. Directing police to undertake random alcohol breath testing during the morning, because it is the least busy period for police is unacceptable. There has been a decline in the number of highway patrol members in the last decade. We need a highly visible and mobile police presence on our roads in adequate numbers.

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<http://www.news.com.au/dailytelegraph/story/0,22049,23345953-5001021,00.html>

<sup>41</sup> St George and Sutherlands Shire Leader (2008) *RTA says 4915 speeding fines have been withdrawn*  
<http://stgeorge.yourguide.com.au/news/local/general/rta-says-4915-speeding-fines-have-been-withdrawn/1157935.html>

<sup>42</sup> newspaper.com Australia (2009) *Speed camera accuracy under fire*  
<http://thenewspaper.com/news/26/2657.asp>

<sup>43</sup> newspaper.com *South Africa: Chinese Car Accused of Impossible Speeds*  
<http://thenewspaper.com/news/28/2857.asp>

<sup>44</sup> newspaper.com *France, UK: Parked Cars Receive Speed Camera Tickets*  
<http://thenewspaper.com/news/27/2729.asp>

<sup>45</sup> newspaper.com *UK Speed Camera Accuses 73hp Honda of Impossible Speeds*  
<http://thenewspaper.com/news/26/2661.asp>

<sup>46</sup> Newspaper.com (2010) *Canada, UK: Automated Cameras Involved in Mistakes and Accidents*  
<http://thenewspaper.com/news/30/3056.asp>

<sup>47</sup> newspaper.com (2010) *Arizona: Police Report Shows Speed Camera Caused Accident*  
<http://thenewspaper.com/news/31/3108.asp>

## **OTHER RECOMMENDATIONS**

### **Research**

Enforcement is a policing issue but it is partly based on an understanding of speed limits and safety. That is an engineering issue. Currently most researchers getting commissioned to investigate issues appear to be psychologists or researchers with primarily statistical qualifications rather than traffic engineers. John Lambert's reviews of McLean et al's papers appear to be from the outside. That the most qualified to undertake the research taking an interest appears as an external critic rather than a primary researcher seems bizarre to say the least. Both psychologists and doctor's of statistics have good statistical skills that can assist with data manipulation within a research project. Likewise mechanics have good skills at taking things apart, locating a problem and reassembling them. These are arguably good skills to have when engaging in surgery. Using primarily psychologists etc. for engineering research appears analogous to using motor mechanics for surgery. Both have relevant skills that would enable to approach the project with flourish but it appears outside their area of expertise and bluntly a bad idea.

A cynical observer may get the impression that a catchy departmental title referring to road safety attracts funding more easily than an engineering department with relevant expertise.

We recommend that more effort should be made to engage more qualified researchers being traffic engineers to conduct research. In recent decades the shift is noticeable. This may explain some of the deficiencies in reducing deaths as enforcement methodology will reflect the research relied upon. Police have enough responsibilities and can't reasonably be expected to nor have the financial resources to engage traffic engineers to revisit research just in case Transport Departments don't do the job properly. At the least a shift in funding priorities would be prudent if safety is the goal.

### **Driver Fatigue**

It is trite to point out that driving slowly for the conditions is boring. It has been widely speculated that complying with unreasonably low speed limits contributes to 'falling asleep at the wheel'. Both the boredom and the increased travel time on long journeys could contribute. Indeed anecdotal indications based on taxi driving experience within our membership indicates that within this chronically fatigued group the two triggers of getting dozy and microsleeps are extended waiting on a slow rank and more relevantly unusually low speed limits eg. temporarily lowered limits at pretend roadwork on the motorway. Prior to the introduction of the trial 110kph limits that section of the Bruce Highway was known as the "doze zone". The apparent subsequent loss of the nickname may not be coincidental. The point is that applying a "slower is safer" philosophy may not only be flawed but may have other consequences.

### **Inattention**

Is there an objective basis for assuming that distraction equates to inattention or could fatal crashes due to inattention relate to or include failure to properly engage in the driving task due to driving too slowly? If it does equate to distraction are drivers who accept the slower is safer message driven to distraction tempted to do other things out of boredom? Given the deaths caused by inattention and the potential relationship with speed camera enforcement and education campaigns we recommend that the issues should be investigated.

## **Conclusion**

The committee is invited to focus on the road safety of the Queensland public by engaging in a lucid consideration of safety and eschewing a myopic back slapping exercise based on supportive comments from hired underlings and commissioned research to support current objectives.

The immediate problem is clearly speed cameras and the problems associated with them are too numerous to repeat in this conclusion. However other surrounding problems with road safety policy have been identified in this paper.

The Committee is invited to seek and take the opportunity to broaden the enquiry with a view to catalysing changes that have the potential to save the lives of Queenslanders.

Queensland has the opportunity to be at the forefront of changing road safety policy to reflect a more intelligent and effectual method of tackling the problem of road deaths. A more careful approach with research can then change the focus of speed enforcement in order to greatly enhance its effectiveness and to develop a culture where dangerous behaviours are more likely to result in apprehension both with regard to speed and other factors that commonly contribute to fatal crashes.

It is long overdue that the Queensland Government adopted a more effective road safety strategy. The Queensland Parliamentary Inquiry into the role of speed cameras is in a position to be effective as an agent of change.

Submitted on behalf of the National Motorists Association Australia

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Michael Bates,  
President