A fairer and more effective driver licence points scheme for NSW, revenue vs. road toll results

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1. Summary

The conference theme is to get off the (not-so-merry) "*merry-go-round*" of doing the same old things that are not working well enough – that applies in road safety - the first two figures below show it.

This paper suggests some ideas in the field of road safety that involve flowing with, instead of going against, innate human psychology to achieve better road safety. And it argues that current road safety programs use too much "stick" and not enough "carrots", and have not been well founded on scientifically rational grounds. Therefore we have reached "*diminishing returns*" from:-

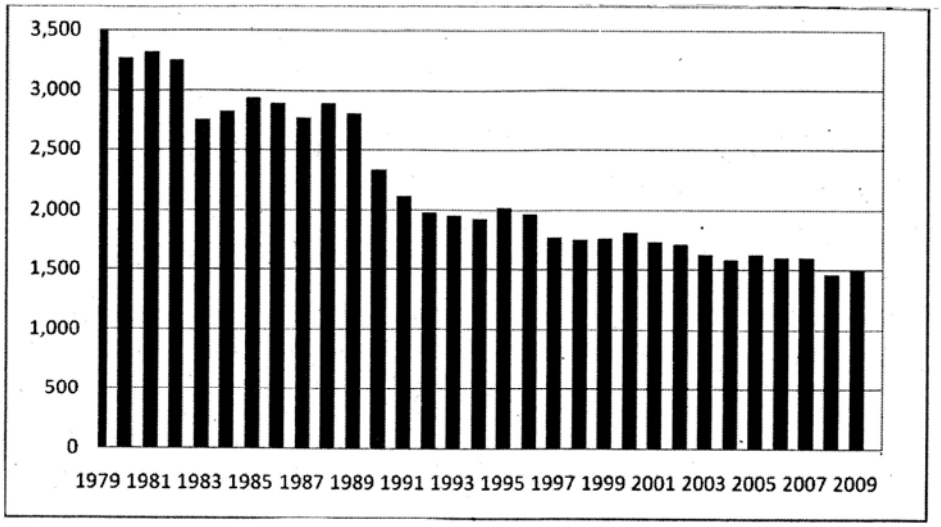
- the demerits points scheme
- speed cameras
- road safety advertising whereby experts tell ordinary people what to do.

Rather than the current Demerits Points Scheme (DPS), this paper suggests a scheme whereby drivers start with 100 points, and when offences cause deductions down to zero, licences are suspended. The points value of 3-point offences would be scaled up to about 20 etc etc. Having a higher ceiling than 13 would allow Police to have more of an educational/interactive role by issuing cautions much more frequently than is the case now. Such cautions would deduct one point, but have no dollar penalty.

It is possible that recent modest gains in the road toll have been more due to huge improvements in vehicles (airbags, ABS braking, design re NCAP testing etc) rather than from more cameras and more people losing their licences due to what many consider to be a clumsy, unfair demerits points scheme.

The "*diminishing returns*" mean an asymptotic approach to what appears to be a stubborn floor in road deaths. This is shown in Figure 1 of the National Road Safety Strategy, 2011-2020 (ref 1) and by the fact that NSW road deaths (year to date till 23 August, ref 2) have been 251, virtually identical to the three-year average of 256 (and up 12% on 2011).

Figure 1: Annual number of Australian road deaths.



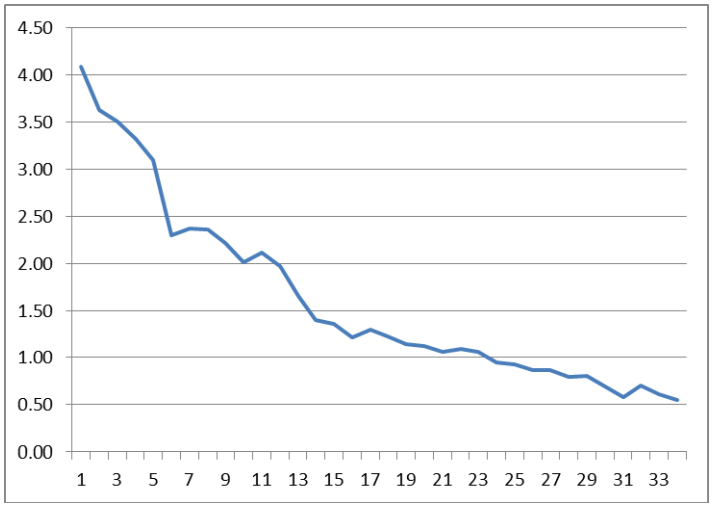
Footnote:- This paper cannot cover choice of the most appropriate performance indicators for road safety. Road deaths? Or fatal plus serious injury crashes? Or all reported crashes etc. This uses road deaths. Often other parameters may be better. The National Road Safety Strategy, 2011-2020 goes on (from Fig 1) to present data in terms of Road fatality rates *per* 100,000 population, but this author considers it preferable to present data with a denominator not in terms of human population or even motor vehicle population, but rather *per* 100 million vehicle-kilometres travelled (VKT).

2. Introduction

This author stated in his paper to the 1995 Federal Office of Road Safety Conference (ref 3):

> *"the decline in road fatalities per 100 million VKT in Australia parallels trends in other countries. Some people interpret this asymptote as being about as far as we can go using the traditional means of enforcement .. where experts or "authority figures" tell the rest... what they should and should not do; i.e. we have reached the limit of "us" and "them" programs. If we are to... reduce the fatalities per 100 million VKT beneath the asymptote then perhaps this can best be achieved by... involving the community in a very dynamic and participative way .."*

Figure 2 shows my calculation of NSW road deaths in each year per 100million VKT (Aust Bureau Stats data) since the worst year on record, 1978, when 1,384 persons were killed on NSW roads:-



The curve is flattening off, but it is still going down – i.e. even if road deaths are constant (as seems to be the case in NSW till 23/8/12), then at least the increasing VKT year after year will bring the curve down. Is there an asymptote? or can we keep total road deaths going down?

This conference wants to "*move ahead with sensible planning*", which raises the issue as to which direction to move ahead in. As Alice in Wonderland put it, "*If you don't know where you are going, then any road will get you there*." We need intelligent destinations, as well as intelligent plans to get us there. The National Road Safety Strategy 2011-2020 (ref 1) is a good start, but it could well be improved by the sorts of things suggested in this paper.

This conference has been announced to be concerned at transport outcomes being "*constrained by short political cycles*". This author suggests that some road safety programs (e.g. school zones and obsession with cameras, with their concomitant boost to Treasury coffers) and the flawed design of the current DPS have been constrained by the poor advice fed to poor politicians by sycophants who should be using rational scientific bases. The Conference brochure asks, "*How do we meaningfully communicate with our political decisionmakers on priorities?*" Most staff and bureaucrats tell the Minister what he wants to hear, and few lobbyists like AITPM are able to get through to Ministers.

Regarding the NSW demerits points scheme, some minor changes came into effect on 31 January 2011. These changes were, this paper argues, far too little and too late. Was it a coincidence that they were only finally introduced just shortly before an election by a very unpopular State government that had had 12 years within which to do something but had done nil? These changes included:-

- raising the threshold from 12 points to 13,
- deleting 22 offences from the list,
  (What sort of petty mentality even inserted such offences in the first place?!
  Should driving in a bus lane really attract a penalty of 3 points? equal to that of speeding at 44kph above the speed limit! The DPS was designed without clear objectives of road safety)

- reducing the points for some offences from three points to two,
- professional drivers applying for a ceiling increase to 14, but only after reaching precisely 13;

(When one considers many offences carry a 3-point penalty, doubling on a long weekend, then the probability that one ends up at precisely 13 points is low, and the benefit of this increase is minor.)

The system needs 'root and branch' reform, not merely the tinkering that has occurred so far. These trivial reforms seem to have come about from years of public complaints and finally the NRMA doing something about it by doing a survey of 1,071 persons.

In this paper I present some data and various ideas that cannot (in the space available) be fully backed up by data, but are offered in the hope that these things may lead to improvements in road safety. I am an Engineer who likes scientific methods and programs based on data with statistical confidence. As my father used to say, "*A problem clearly diagnosed is already half-solved*."

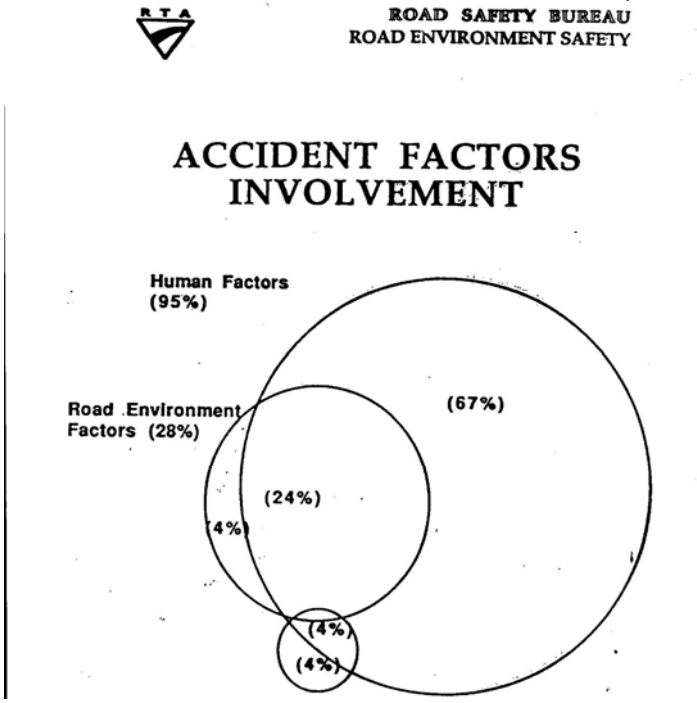
On becoming RTA Road Safety Manager, Western Region in 1990 the anomalies shown in columns one to three of Table 1 challenged me to attempt to diagnose the road trauma problem by:-

(a) commissioning a major psycho-analysis study (refer to ref 3 for parts of it), and

(b) devoting much effort to analysing all available statistics so as to be able to rank priorities for attention roughly in line with the causes. I prepared a yearly statistical report (ref 4), broken down into local government area, that went further in depth than the overall yearly statistical report (ref 5), but unfortunately that practice has not continued and regional implementations now seem to be data-poor, merely following centralised dictates that focus too much on speeding; e.g. one longserving officer said, "*Drink-driving is not going down at all in recent years; there needs to be a new big push on it in rural areas, but the RTA won't allow local Safety Officers to do designated-driver programs.*"

3. Relative contributions to road trauma from various factors

The causative factors in road crashes were once (1991) illustrated as follows; **Figure 3** below shows the involvement of various factors in road accidents (as they were then called) as follows:



It has been difficult to obtain data in similar format to update that in the above diagram. It is possible that the 'Safe System' approach as described in the National Road Safety Strategy might lead to a broader definition of what comes under road environment factors. Nevertheless it is seen that human behaviour factors (95%) are involved in far more crashes than road environment factors (28%).

This conference, as is typical of us Engineers, Professionals etc, seems pre-occupied with data. Data on roads and trips etc is in Sessions 1b, 2a and 2b, and session 4a focuses on Safer Roads. We need more data on behaviour factors, and a future conference could well include a session on Safer People.

Let us attempt to dissect the causative/involvement factors within the human behaviour area.
Table 1 shows the percentage distribution of road fatalities as follows:-

	RTA W region 3yr-av 1992	Whole of NSW 1992	1992 deduction of comparison of W region vs. NSW	RTA W region 5yr-av 2010	Whole NSW 5yr-av 2010	Ref 5 NSW Stats 2010	Comments re Columns 1 to 6 re NSW stats today	Nat'l Road Safety Strategy
			Col 1 vs. Col 2			Col 6		Column 7
Speeding	41%	36%	About the Same	41%	39%	40%	Little achieved despite huge resources	34%
Drink-Driving	38%	24%	One and a half times as bad	26%	20%	21%	Better but a long way to go, and rural still bad	30%
Drug-Driving	uk	uk	n.a.	uk	uk	uk	Col 7 shows it is emerging big	7%
Non-use of Restraints	46%	24%	Twice as bad	18%	11%	12%	Hugely better but rural cd do better	20%
Fatigue	22%	15%	One and a half times as bad	20%	17%	15%	Slightly better, rural still worse	20-30%

Footnote: - in one cell, data on fatal crashes rather than fatalities had to be used; the difference would be minor.

Well may we ask questions:-

- Is the overall allocation of resources and effort in reducing the road toll in line with this sort of distribution of factors, or do we overemphasise one sector? (e.g. heavy vehicle regulations)
- Do we spend too much on roads, and not enough on achieving human behavioural changes?
- Are we achieving so little results re speeding despite the huge resources devoted (e.g. lots of cameras) because we are not taking suitable account of real human behaviour issues?
- Does overemphasis in one area (e.g. speeding) mean underemphasis on another area (e.g. alcohol) that, within limited resources, could, on benefit-cost ratio grounds, be more fruitful?

On being confronted with the magnitude of the behavioural issues (see column one of Table 1 above), I commissioned a Masters degree Psychologist to interview a large and statistically-meaningful sample (568 people) to in effect psycho-analyse the western region people as to WHY, in parameters like alcohol and seatbelts, they differed so markedly from the rest of NSW. He also analysed which "buttons" we could press within people to encourage them to change behaviours, i.e. how to design our education and advertising campaigns to maximise audience receptivity. Some of these fascinating and useful results are in ref 3. The Psychologist grouped drivers into two classes:

- Normal drivers who occasionally make mistakes.
  This is recognised in ref 1: *"Pg 9:- Much of Australia's road safety effort focussed on countering illegal behaviours... it is now understood that [many] casualty crashes result from ... road users making mistakes. Pg 12:- Guiding principle... [normal] people make mistakes."*
- "Hoons", those who indulge in excessively risky behaviour.
  The "hoon factor" was defined scientifically as a statistically-significant grouping of answers to a particular group of questions. Ref 1 mentions on page 42 "*risky behaviours are still prevalent among an irresponsible minority*"...

4. How can we best tackle behavioural factors?

4.1 Philosophical background

What do we mean by a "good driver"? What do we mean by a "bad driver"?

Can we design and operate road rules and enforcements that turn "bad drivers" into "good drivers"? The mere absence of having had a crash does not necessarily mean the person is a "good driver. The mere fact of having been involved in a crash does not necessarily mean that a person is a "bad driver". It may have been entirely the "fault" (not a good word) of the road, another road user or the vehicle, e.g. at least 6 of the 365 fatal crashes in NSW in 2010 were due to "*equipment failure*" (Ref 5).

Throughout history "pendulums" of social things have usually swung too far, and the fascinating field of socionomics studies these sorts of phenomena (ref 10). In the 1960s we were far too lax and many drivers regarded it as a fundamental right to drive while very drunk. However, in recent years has the pendulum swung too far the other way with ever-increasing "big stick" punishments?

Criminology tells us that the certainty of getting caught is a bigger deterrent than the hugeness of the punishment. Politicians choose to ignore that before elections and promise voters ever bigger punishments for all sorts of things, not only re road behaviour. (Of course there is a role for penalties)

Do we really want a George Orwell "big brother" type of society with RTA monitoring cameras poked at us everywhere? a society where, instead of educating individuals to be responsible, we have an all-powerful nanny State through its machines controlling us? Totalitarian regimes (e.g. USSR/East Germany till 1990) show us that big sticks and brutality can work well but only for a while (in that example, 73/45 years), but the effects wear off, and eventually the big sticks work no longer. Lasting behavioural changes come from a suitable combination of "sticks" and "carrots".

4.2 Are today's Regulators unreasonably obsessed with speeding?

When one hears politicians and bureaucrats piously railing against "speeding", then claiming that "speeding" is the number one issue to be tackled, with huge resource commitments following, it needs to be realised that the data on which they base conclusions about speeding are very unreliable. It seems that politicians and bureaucrats muddle two separate concepts:

- "speeding" which means driving in excess of the posted speed limit, and
- "speed" which means that the vehicle was moving but its speed was <u>below</u> the speed limit.

(It is difficult to have a crash if the vehicle is stationary! ALL crashes involve at least some 'speed'!)

4.2.1 Reliability of Data

<u>Alcohol</u>:- The data in Table 1 for the role of *alcohol* are accurate, because blood samples are taken after a crash. In NSW in 2010 alcohol was known to be involved in crashes which killed 74 people, and known to be not involved in 274 deaths; it was unknown in only 57 deaths (page 83 of ref 5). Row 2, column 6 of Table 1 therefore states alcohol was involved in **21%** of road deaths (74/74+274 = 21%). Using crash data, the result is 19% (58/58+253=19% and the 54 unknowns are not included). That is why the one-page "Main Points" (page 7 of ref 5) is precise in stating **19%** for alcohol's role:

> "*<u>Amongst those road crashes in which the involvement of alcohol is known</u>, alcohol was a contributing factor in .. **19%** of all fatal crashes*". (my underlining emphasis added)

<u>Occupant Restraints</u>:- Similarly, usage of a seatbelt or helmet is known in most cases: page 77 of ref 5 shows that 254 people were killed with "*device worn*", 34 were killed with "*device not worn*", and the "*unknowns*" were 58. Row 4, column 6 of Table 1 therefore states that non-use of restraints was involved in **12%** of road deaths in NSW in year 2010. Again, we do not include the unknowns.

<u>Fatigue</u>:- Page 14 of ref 5 admits how difficult it is to estimate if fatigue and speeding were involved in a crash and discusses the criteria how assessments are made, i.e. there is a large degree of subjectivity and therefore the data are uncertain (Who knows? Plus or minus 50%?).
The one-page "Main Points" (page 7 of ref 5) is honest in admitting the uncertainty in its conclusion:

> "*Fatigue was <u>assessed as being involved</u> in 15% of fatal crashes*" (my underlining added)

Speeding:- Here, no such honesty prevails. The cultural bias of the bureaucrats comes through and the conclusion (one-page "Main Points", page 7 of ref 5) is stated as being firm and definite:

"*Crashes which involved speeding represented at least 40% of fatal crashes*".

Perhaps including the words "*at least*" is meant to cater to readers' fears that it could be even worse.

How are data on speeding obtained?

In many cases the Police officer attending a crash is not a Highway Patrol officer (HWPO), and very few HWPOs have been trained in crash investigation to enable them to assess (a) speed before brakes were applied by measuring skid marks and using maths, or (b) speed at impact from vehicle damage.

The P4 Forms in use during my time as Road Safety Manager (1990-97) had spaces to fill in time, date, weather etc, and a box about speeding. The Police officer after valiantly directing traffic, working with ambulance officers to extricate bodies etc, then finally gets around to filling in the P4 Form. Maybe a witness *said* the vehicles were in excess of the speed limit, but can they reliably tell the difference between a vehicle at 115kph and one at 95kph (under the 100 limit)?! And the trauma of a crash can bias recollections. (For example my father investigated all aircraft crashes in Australia in 1939-47, and was amazed that some witnesses said the incident began with the aircraft bursting into flames, yet photographs etc revealed that no such flames occurred till later on). Maybe the vehicles were doing 95kph, under the 100 limit – how can he know? He or she looks at the mangled vehicles, the broken glass on the road, the skid marks etc, and wearily ticks the box Yes to speeding. Thus fundamental data on speeding is not accurate at its source, and I mean no criticism of Police in saying that. Recently I found out that Monash University's Accident Research Centre agrees with my long held view, "*During 1999 .. suggested that MUARC .. examine the possibility of better defining crashes involving speeding… review of the NSW RTA's procedures .. led to the recommendation that Victoria should not adopt the same procedures .. insufficient scientific basis .. study by the RTA was .. deemed unsuitable .. not feasible*." (Ref 9a).

Since 1997, data on road crashes is entered into COPS (computerised operational policing system) by an officer using what he/she has written in the notebook. At least the P4 form prompted a specific question to be answered at the crash scene, but data are now entered into COPS some time afterwards. Ref 5 states on page 14: "*The identification of speeding .. cannot always be determined from the [COPS] reports. Some circumstances suggest the involvement of speeding. The Centre for Road Safety has therefore drawn up criteria …*" [for making estimates] (my underlining emphasis added).

Since the RTA's speeding data are so unreliable, then all conclusions (e.g. 40% in Table 1) derived from such data are unscientific. It means we have huge expenditures of public moneys (such as speed cameras) based on suggestions, biased interpretations and in effect guesses. What if the *true* figure for speeding in fatal crashes is 11% not 40%??! If so, we should concentrate on alcohol at 21%, restraint non-use at 12% and fatigue at 15% rather than speeding at 11%.

In order to get better information filled in on the P4s in western region, thus better enabling us to base road safety programs on analysis of meaningful stats, I arranged Australia's first residential-intensive 'crash' course (pardon the pun) in crash investigation in 1993. Most of the HWPOs in western region (22 Police) and all 22 of my RTA Heavy Vehicle Inspectors stayed in a motel in Parkes for four and a half days. Expert teachers came from Victoria and overseas, and included Bathurst's Sen. Sgt Chris Tillot with his 17 years' of experience. We spent a complete day on tyres and skid marks.

4.2.2 The effects of speed limits, and speed - involvement does not mean causation

Just because speeding is involved does not necessarily mean that it is the cause and that removing the speeding would mean the crash would not occur. It may have occurred anyway. It is rare for a Police officer attending a crash scene to have been trained to do the sorts of sophisticated investigations that are required to determine if the crash would have occurred anyway, and whether or not speeding even occurred, or was involved, or was a causative factor.

Fortunately some accurate crash investigation studies do exist, such as that done by the University of Adelaide (ref 8). 56% of the 695 crashes reviewed in this study were in 50 or 60kph zones, and 33% were in 90 to 110kph zones. One would expect that crash participants and witnesses would be more frank in admitting to these independent university investigators actual vehicle speeds and speeding than they would to Police, who laid charges in some crashes; 14% of the crashes were fatal. However the one thing that stands out to me in this report is the amazingly UNDERWHELMING presence of speeding. Only ONE of the 52 excellent recommendations relates to speeding!

"*..adopt appropriate speed limits, and achieve reductions in travelling speeds .. should continue*" Note that these investigators call for appropriate speed limits not always lower speed limits!

For some crashes lowering the vehicle speed and/or lowering the speed limit mean that the crash would not occur. For all crashes the laws of physics dictate that lower speeds mean lower kinetic energy available to do damage; i.e. if the crash would have occurred anyway, and if we can generally bring down all speeds, then the *consequences* of each crash will likely be less. Therefore bringing speeds down generally is a worthy objective, especially changing speed limits in residential areas from 60 to 50kph, because one encounters more bicyclists, pedestrians and children there.

However, extending the argument re bringing down speeds generally "reductio ad absurdum", why not make all speed limits 10kph?! All of us would say that is silly, and so it is, but *why* is it silly? Do we have adequate transport modelling techniques to choose appropriate speed limits by balancing road safety (which should not be the sole objective) with issues of amenity, traffic efficiency, traffic management and infrastructure investment? The objects of the Road Transport (Safety and Traffic Management Act, 1999) are "*3 (c) to improve safety and efficiency of transport on roads and road related areas*" – it seems that safety is to be balanced with efficiency, whatever that means. Have such things been debated within expert institutions such as AITPM or publicly?

Contrary to some slogans, Speed does not kill. It is not the speed that kills, it's the sudden stop! Speed thrills – most of us like watching car races. Many people enjoy high speeds, and telling them to slow down activates psychological "switchoff" mechanisms. Risk and severity of a crash increase with speed, and I offer suggestion 7.7 as part of education to make drivers aware of the higher risks.

The muddling of involvement with causation and the dishonest use of speeding percentages (like "*at least 40%*" see 4.2.1) is the basis for frequent and frantic appeals that if only we removed "speeding" (i.e. if all of you motorists out there simply obeyed the speed limit) we would enter utopia by reducing fatalities by 40%. Such cannot be scientifically supported. The justification for so many speed cameras comes out of propaganda manipulation – create the big bad bogy demon of speeding and rally the people behind the leader who will lead the charge to rescue the people from it. Never mind if he will commit all sorts of violations of personal liberties and waste lots of taxpayers' money.

Look at the results – despite the huge and greatly-increasing commitments of money and resources and the massive impacts on motorists being booked in record numbers by speed cameras etc (which have brought measured speeds down a great deal) the road toll has not come down a great deal.

Could it be that being obsessed with speeding as top priority means that other fruitful areas like drink-driving, bicycle helmets etc have been neglected? And we are not investigating crash causes in sufficient depth. The current obsession with speeding is not rationally-based, but is ideological.

4.3 Are today's Regulators unreasonably obsessed with cameras?

Even if we bludgeon all drivers down to the speed limits in those locations (~400km of roads) where the cameras occur, what about the other 41,000km of road network in NSW where there are no speed cameras? (fixed or mobile). Road safety is better served by roving HWPOs (see quotes in section 6).

Cameras are purely punitive; they are not educational. There is a valid place for them in enforcement e.g. redlight cameras, provided they are properly calibrated and not merely catching drivers through an amber light, people who find it cheaper to pay the unfair fine than to take a day off work in court.

We need to ask those obsessed with speed cameras why Germany with no speed limit at all on its autobahns has a fatality rate of 0.7, which is substantially better than NSW's 0.9 and Australia's 0.8. France with its freeway limit of 130kph has a fatality rate of 1.0, not much different to NSW's 0.9. (see Table 2 on page 18 of ref 5, rates per 10,000 vehicles).
While in Germany and France a few weeks ago in 2,250km of driving I saw only one speed camera, but saw lots of these signs; this one was on a two-lane freeway like our F3 from Sydney to Newcastle.

Speed cameras have a time delay, and so any consequent behaviour changes are less than would be produced by immediate Police intervention to either book or caution. When I was Road Safety Manager (1990-97) several HWPOs expressed anger to me along the following lines:- *"What is the use of the system sending a ticket to a driver three weeks after he is dead? If I pull him over and put the wind up him, then he will drive more carefully and be less likely to crash. But if the camera goes 'click' and he carries on down the road and kills himself or others, then of what use is the ticket?"*

The average HWPO is paid about $75,000 in wages. The full cost must of course include overhead costs for vehicle, rent, electricity, office supplies, superannuation levy, insurances etc. In the RTA the multiplier was 2.25. If we assume that the Police multiplier is 2.67 then we deduce:-
it costs the State budget ~$200,000 to put ONE Highway Patrol Officer plus car on the road.
If the HWPO books four people per shift then the income to the State from fines would be about $200,000 per year (less administration costs in SDRO). Therefore in effect HWPOs are close to being self-funding and cost the State nothing. Why then the reluctance to employ more?

The photo below shows an average-speed-camera facility being built north of Molong on the Mitchell Highway. In the RTA I was also a Traffic Management Manager, covering minor roadworks under $250,000 (e.g. roundabouts etc) and know that this photo shows over $200,000 of expenditure, including electricity supply and computer costs. Another one is being built about 20km away.

This facility will issue Infringement Notices only on heavy vehicles that have an average speed between these two facilities in excess of the speed limit. It will not issue tickets on speeding car drivers – at least not yet! The most recent AADT data is 2854 for year 2002, having risen from 2170 in year 1992; if we assume the same growth and 9% heavy vehicles of which 1% are booked, then this facility is a lucrative business, earning over $300,000/year. Of course, truckdrivers will quickly adapt to this facility (with minimal benefit to road safety) and income will become zero.

This facility is a waste of money – for $400,000 we could instead hire two HWPOs, who would rove far and wide in western NSW (not just along this 20km stretch) and who would cover the whole range of behaviours (alcohol, seatbelts, crossing unbroken lane lines, overtaking etc) and not only speeding as these cameras will do. The best means of getting behavioural change is deterrence and education and enforcement, which are all achieved by HWPOs and their blue-flashing lights.

5. Demerits points schemes

5.1 Design and objectives of a demerits points scheme (DPS)

In designing a new demerits points scheme, or evaluating the success of the old one, it is useful to ask, "*What are its objectives?*". Almost every piece of legislation has a section called "Objects" i.e. what the legislation aims to achieve. Unfortunately the objects of the current DPS are not in any legislation. The DPS is described in sections 14 to 18A of the Road Transport (Driver Licensing) Act 1998 which includes among the Objects of the whole Act (but there are no specific objects for the DPS):

> "*3 (e) to provide a means of enforcing safety standards relating to the driving of motor vehicles*
> *3 (h) to improve road safety and transport efficiency…*"

Road Rules 2008 (Ref 6) say nothing meaningful re Objectives. Section 3 "Objects" merely states:

> "*The objects of these Rules are .. to provide for road rules .. to provide for other road rules*"

The website www.rta.nsw.gov.au/cgi-bin/index.cgi?fuseaction=demeritpoints.form states:

> "*The Demerit Points Scheme helps make our roads safer by encouraging motorists to drive responsibly*." Though this is not in legislation, the words "*encouraging motorists to drive responsibly*" do provide useful guidance. The objective of the DPS seems therefore not to punish drivers, but to "encourage", aiming, for the purpose of road safety, to achieve "responsible driving", which implies more than mere compliance with rules, and connotes intelligent human behaviours.

However the current DPS operates mainly in a punitive way, and there are negative connotations in accumulating "demerits". My new DPS scheme (see section 5.3) is more positive in that it proposes that all drivers (except L and P) start with 100 merit points, which are diminished by points offences.

In an ideal system a person with 100 merit points could be regarded as a "100% good driver", and a person with zero merit points would be judged as being a bad driver to lose his licence. And an ideal system should provide logical deterrents, with a logical relationship between

> (a) the size of the dollar penalty and number of points attached to an offence, and
> (b) the size of the consequent effect of offences of that type on the road toll.
> I.e. we adopt the principle – if we want to improve road safety, then we need to have the biggest penalties attached to the most risky behaviours that cause most damage, medium penalties for the medium range of risky behaviours, and minor penalties for things that have minor effect. There needs to be a gradation, "let the punishment fit the crime".

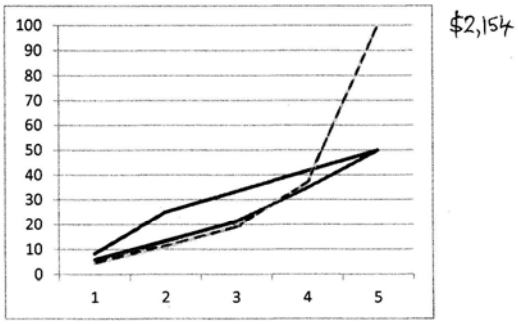
Let us then put some logic and rationality into it, and consider that demerits points for *speeding* offences should be related to the extra kinetic energy available by that speeding to damage people.

5.2 Problems with the current demerits points system

5.2.1 Unfortunately the kinetic energy relationship of the current demerits points system for speeding bears no resemblance to road safety risks. In fact it goes the wrong way.

If speed limit is 80kph

Band	over by RANGE	demerit points now	$ now	choose speed over by	speed is thus	Kinetic energy	extra K.E.	scale to 100%	6pts equals halfway now, so new points	current points scaled to fit graph	current$ penalties scaled to 100% of$2154
				0	80	6400					
1	0 to 10	1	$105	9	89	7921	1521	0.12	6	8	5
2	10 to 20	3	$243	19	99	9801	3401	0.26	13	25	11
3	20 to 30	4	$417	29	109	11881	5481	0.42	21	33	19
4	30 to 45	5	$799	44	124	15376	8976	0.69	35	42	37
5	over45	6	$2,154	59	139	19321	12921	1.00	50	50	100



This graph (limited by the author's ability to use the software) shows :

- Across the X-axis, the first band is 0-10kph over the speed limit, and I choose to model the kinetic energy typical of this band as being 9kph over the limit, and for the second band 10-20kph over the limit I choose a speed of 19kph and so on.
- The lower of the two unbroken lines shows the points penalties in my new DPS, these points being exactly modelled on the extra kinetic energy that has an adverse effect on road safety
- The upper of the two unbroken lines shows current points penalties (multiplied by 8.333), and it can be seen it goes the wrong way, applying big punishments for minor offences and proportionally smaller punishments for major offences. It can be seen that for the small increase in kinetic energy in going from band 1 (0 to 10kph) to band 2 (10 to 20kph) that the current points system has a large increase from 1 to 3 points. This is crazy when the huge increase in kinetic energy in moving from band 3 (20-30kph) is penalised to only a minor extent by the addition of only one point (from 4 to 5).
- The dotted line is the dollar penalties scaled from zero to 100% of the maximum $2,154. Except for the large increase in moving up beyond band 4 (30-45kph over the limit), it can be seen that the financial penalties almost exactly track the theoretical kinetic energy increases

5.2.2 It is too easy for ordinary people to lose their licences for a few minor offences.
It is impossible for many drivers to comply 100% of the time with speed limits

- that have not been set "appropriately" to resemble the type of road infrastructure design
- that are not reinforced to remind the driver by means of reassurance signs.

For example one could be travelling at 81kph in one of the many 60 zones in the Blue Mts where the limit varies frequently between 60, 70 and 80, and it is difficult to know (due to lack of reassurance signs) what the limit is. Suddenly in one booking a driver could lose 8 points in a holiday period.

5.2.3 A lot of ordinary drivers are losing licences, losing their jobs/income/livelihood for a series of minor incidents that do not significantly affect road safety. In other words all this enforcement has a social cost, and cannot necessarily be justified by merely quoting how much the road trauma problem costs the community (e.g. ref 1 states, "*road crashes cause .. annual cost to the Australian economy .. $27 billion.*") without also considering the counterbalancing costs e.g. lost jobs, stress etc?

5.2.4 The current system is unfair to Highway Patrol Police too, as they are cast into the mould of being only punitive, and this can reduce job satisfaction among HWPOs and create stress (except for the few sociopaths – one such was evicted from a major joint RTA/Police enforcement exercise by his fellow Police for being too harsh, and was sent back to Wollongong partway through the exercise!) What about measuring the social cost of Police 'burning out'? Some motorists on being booked have said to HWPOs, "*Why don't you get a real job? How about catching some real criminals?*" etc

5.2.5 What about the cost to taxpayers of petty points' impositions being fought in court?

5.2.6 One of the unintended consequences of overemphasis on speeding is that some motorists, especially motorcyclists, choose not to drive in holiday periods when double demerit points apply. This has bad effects on tourism and roadside businesses.

5.2.7 By narrowing the tolerance between the speed limit and the point at which a booking occurs (e.g. with Victorian speed cameras) then all motorists, especially motorcyclists, are thus required to pay too much attention to looking at the speedometer. That means (as per the arguments against using a mobile phone while driving) less attention to trucks, pedestrians, bicyclists, intersections etc. The too-frequent looking at the speedometer has even been given a name among motorcyclists, who are, as a matter of self-preservation, more accustomed to looking *inside* a car in order to judge in advance the likely actions of the driver; they call it the "speedo jerk", the head movements that accompany looking down at the speedometer, and it means to a motorcyclist that he/she will avoid that motorist.

5.2.8 I know good drivers who have lost licence for petty offences, but they were not a bad driver to begin with and there is nothing in them to change; they drive the same after loss of licence as beforehand! E.g. a friend who has never had a crash in 42 years, nor ever come close to it, now finds herself on 8 points (close to losing her licence) after a series of petty revenue-raising offences, but there is nothing in her behaviour that needs changing to make her safer and less likely to get booked! Also her friend, similarly driving all her life with no crash ever, lost her licence from a series of trivial speed camera offences, and the only change in her behaviour is to drive on back streets to avoid the cameras on arterial roads -- the only thing that a harsh and clumsy speed camera system has achieved is that we have caused her to increase the risk to pedestrians and bicyclists in residential areas!

5.2.9 Over-emphasis on control of speeding has created new hazards while overtaking, both on two-lane roads and in overtaking lanes. Motorists fearing that Police or RTA mobile cameras may book them are adhering too strictly to the speed limit while overtaking, thus either spending too long on the wrong side of the road, or congesting the overtaking lane and preventing motorists behind them from also overtaking. The following situation is occurring:
A column of six cars on a 100kph two-lane road is trapped behind a car/truck doing 80kph for many km; the road widens out for an overtaking lane and the slow car typically speeds up to 95kph; the first car in the column daring not to exceed 101kph takes the <u>entire length of the overtaking lane</u> to slowly pass the car in the left lane, while being followed by five frustrated drivers who cannot overtake, and who then blow the horn, make rude hand gestures, or swing to the wrong side of the road in desperation to indulge in risky overtaking manoeuvres rather than be restricted to the slow car's 80kph again for the next many km till the next overtaking lane.
This author believes that overtaking should be done as quickly as possible, and this means maximum acceleration initially on changing lanes to the right, followed by decelerating back down to the speed limit as soon as practical after changing lanes to the left. On a two-lane road this minimises time spent on the wrong side of the road, and in overtaking lanes it clears the right lane.

5.2.10 Unfortunately at the moment due to insufficient HWPOs doing real on-road enforcements (and I don't mean mobile speed cameras) one can have bad drivers on zero demerit points and good drivers losing their licences; the DPS is thus not an instrument of road safety but is a form of tyranny, in effect State-funded terrorism by closeted bureaucrats against normal motorists who receive too much attention, and the result is that the road toll is not being brought down as it could and should be.

5.3 A new Demerits Points System

An ideal demerits points system should correspond to crash frequency and severity. We want a demerits points scheme whereby an increasing number of demerit points (or as I argue below a decreasing number of merit points) progressively serves as a behaviour- modifying stimulus to which the driver can respond by driving in such a way as to reduce the probability of road trauma.

<u>I propose a new demerits points system with the following ingredients:</u>

5.3.1 Every driver receives 100 merit points (P and L plate drivers receive say 40 to start with).

5.3.2 Offences should be kept on the points tally for six years, not three. Like assets in accountancy 'depreciate', then points could diminish after the end of the second year gradually at a rate of 20% per year, rather than suddenly dropping off after three years.

5.3.3 Police be encouraged to have more frequent interactions with motorists to give cautions which have no dollar penalty, but cost the motorist only one point. Police can have more of an educational/warning role, and less (not zero!) of a purely punitive role.

5.3.4 Most current point scores could be scaled up by a factor of 5. E.g. failure to wear a seatbelt now attracts 3 demerit points; in future one would lose 15 points out of the ceiling of 100.

A strict scaling up of the points for current offences would involve multiplying the current points allocation of each offence by 100/13 = 7.69 however in order to make the system less "lumpy" (and because points are kept on for 6 years not 3) it is suggested that most current offences, initially, be multiplied by 5, and that further research be done on the relative importance that a breach of each offence has on the road toll, and then points (and $penalties) could be scaled up or down accordingly.

5.3.5 Points for speeding offences should be scaled on logical, rational grounds that relate to the kinetic energy that creates road trauma, rather than on the current illogical grounds (see analysis in section 5.2.1). This means the points on a scale of 1 to 100 would be as follows:

- for 0 to 10kph over the limit deduct 6 points (this is about one-sixteenth of the way to losing one's licence, similar to the current system's one point which is one-thirteenth of the way)
- for 11 to 20 kph over the limit, deduct 13 points
- for 21 to 30kph over the limit, deduct 21 points, and for 31-45kph deduct 35 points
- for speeds above 45kph over the limit, deduct 50 points out of 100, which is halfway, the same as now whereby such an offence attracts six points towards the threshold of 13 (it used to be 12)

5.3.6 Camera offences should carry only half the amount of points and half the dollar penalty that occur when a Police officer issues an Infringement Notice. A Police officer assesses conditions like weather, time of day, traffic density and makes a considered decision to issue a ticket. The camera has no intelligence and merely goes 'click' e.g. in a school zone at 0929am when there have been NO children anywhere in sight for 29 minutes it would be better for a Police officer to issue a caution.

5.3.7 All drivers who are about to lose their licences and Professional Drivers can argue for an extension of 30 points to a Panel of ordinary people – see section 7.5 for details.

5.3.8 Abandon (or greatly reduce) the fee charged by the road authorities for a driver to access his/her driving record and points balance. Making it much easier to access one's points balance means that awareness is raised, and behaviour modification is more likely.

5.3.9 Create economic incentives whereby insurance companies (and others) could separate insurance premiums into a base fee applicable to all drivers (say $800) plus a modest additional fee (say $100) which may be 100% discounted for a person with 100 merit points, and only x% discount for x merit points. Just like we have seniors card discounts, shops could provide discounts on a sliding scale for good drivers who show a recent printout of their points balance.

6. Revenue-raising vs. Road Safety

The NSW Auditor-General's report (ref 7) was in mild terms, but really it was a damning indictment of RTA incompetence and arrogance; (I know, I worked in the RTA 1990-2000). The A-G wrote:

- "*69% of the 1700 submissions viewed cameras as revenue-raisers"*
- "*Our .. analysis .. only 40* [of the 141] *had statistically-significant reductions*"
  [the context was 40 of 141 cameras, and "*clear road safety benefit*", not reductions in speeds]
- "*RTA no longer uses evidence of a speeding problem to select these sites"* (!!)

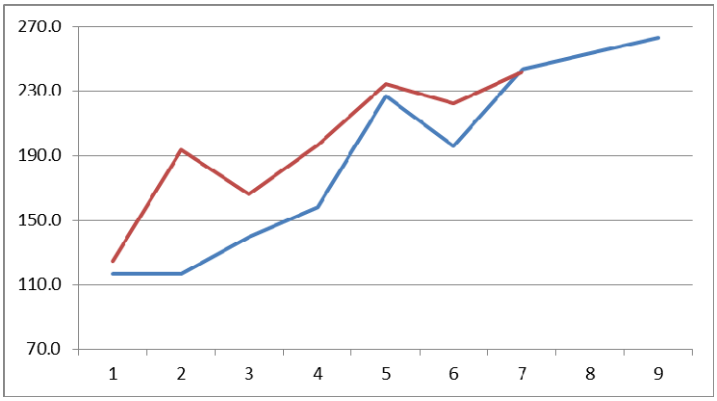
- *"the safety camera and mobile speed camera programs are too new to conclude if .. crashes.."*

Much of the public concern about revenue-raising is that speed limits are set far too low and it is unrealistic to expect ordinary motorists to go that low, especially when the road infrastructure looks so typical of higher speed limits and in effect entraps people into, wittingly or unwittingly, speeding.

In preparing this paper I spoke to five long-serving retired Police officers (LRPOs), and currently-serving officers in the RTA, Police etc. I was careful to ask their views not project mine onto them. I was astonished at the strong opinions of these people, many at a very senior level. The LRPOs had between them over a century of experience! I quote them verbatim; [bits in square brackets are not exactly what they said but words to the effect of] (the final three dot points are not from Police):

- *"silly 50kph limits on highways invite people to break the law"* (e.g. Lucknow)
- *"cameras .. it IS revenue-raising; overemphasis on speeding .. too much money on cameras"*
- *"School zones were forced on us and difficult to enforce* [40 limit is unrealistically low]*"*
- *"speed camera locations .. the RTA fudged the criteria three times to force a camera on us and it was pure revenue-raising"*
- *"Make no bones about it! Cameras and HWPatrol* [enforcing unrealistic speed limits] *are there to generate a revenue stream for Governments"*
- *"Speed cameras! What a waste of time and money! Nothing to do with road safety!"*
- *"The government is just revenue-raising, and the sad thing is* [it diverts effort away and we have lost the battle which we had won about] *children wearing bicycle helmets"*
- *"the overwhelming focus is on speeding,* [to detriment of drink-driving etc] *– whether that is good or not the RTA does not know* [or care]*; big push to cameras and technology..* [not good]"
- *"Drink-driving is not going down at all* [central-western NSW] *in recent years but the RTA won't allow designated driver programs,* [putting too much resources into speed cameras]"
- *"Head Office is full of witless morons, who don't know what they are doing, but only want more power and control."*

The amount of revenue raised is huge, in the vicinity of $250 million per year, as shown on the following graph which presents data from the Office of State Revenue over the nine years 2003/04 till 2011/12. The data are in Appendix One, and are from two different sources within OSR. The two lines, being totals, should be identical but various categories are defined by OSR in different ways:



7. Positive suggestions for reducing the road toll

This paper raises ideas, some of which are based on my experiences in RTA western region during 1990-97, and some of which are based on theoretical principles, and require further investigation.

7.1 Scrap over 90% of speed cameras and put all that money into more Highway Patrol officers. Blue flashing lights provide a 'unique' educational experience and good deterrence over wide areas.

7.2 Scrap all 40kph school speed zones (with their huge capital costs and operating costs of yellow flashing lights). Instead employ more School Crossing Supervisors and empower them by training them as Special Constables to issue tickets, enforcing 50 or 60kph limits using Lidars or Radars. They can talk to children, educating them in road safety, something that cameras cannot do.

It is time to say that the **school crossing 40k speed-zone Emperor has no clothes**, and all this huge money spent as a cost has had very small benefit because there never were any significant numbers of children killed or injured near schools in the first place. The BCRs would be woeful. To those who say, "*Even if it saves one life, then it will be worth it*" I say "*NOT if in doing so we divert money away from programs that could save 50 lives. All that we have thus achieved is to kill 49 people*."

7.3 Introduce the new 100-merit points system as described in section 5.

7.4 Conduct research to refine and fine-tune the appropriate points for each offence based on a scientific appraisal of the contribution of each offence to road trauma.

7.5 Provide a community-based review panel to allow drivers about to have their licences suspended a chance in a non-court environment to be granted another 30 points on a first application (20 points on a second, 10 on a third, then that's it). This kind of jury system could be administered by the NRMA. Retirees could volunteer their time, but be paid meal and travel expenses. The panels would review drivers who present their explanations and reasons and promises to do better in future. The process should be open and transparent and be documented by paid secretarial staff. Only real costs of staff, meals and travel would be charged to drivers who appear before the panel.

7.6 Erect lots more speed limit reassurance signs so that motorists are not as unaware of exactly what the limit is, as so often happens now when speed limits do not match road infrastructure.

7.7 Graduate vehicle speedometers according to braking distance (i.e. the square of the speed) rather than linear with speed. Because modern cars are so quiet with good suspension and powerful engines it is easy to move from 100 to 141kph, at which stage the kinetic energy is DOUBLE that at 100kph. It is a sobering fact, but one not realised by few, that if one needs to do emergency braking to avoid hitting an object, then the distance to stop from 141kph is double that from 100kph.

7.8 Research and quantify the negative effects of ever lower speed limits. For example, imposition by the RTA of 50kph on major highways through rural towns like Lucknow, Molong and Cudal causes loss of transport efficiency and increase of fatigue – 70 or 80 or 90kph would be a safe limit. If road safety is the ONLY consideration, then why not set speed limit at 10kph? Where is the balance point between competing social factors of lower speeds for road safety and not so low?

7.9 As the person who raised the limit on the Newell Highway in 1992 from 100 to 110kph (with NO adverse effect on road safety, I might add), I urge road authorities to set speed limits in harmony with the natural psychology of normal drivers (the old 85th percentile method) in reacting to the road infrastructure, rather than on the paranoia of RTA bureaucrats,'knee-jerk' responses of politicians, or occurrence of merely one horror crash. I.e. do it rationally and treat drivers as reasonable human beings, not cattle to be bludgeoned into submission by more "stick". When Bruce Baird was Minister in the early 1990s he announced a "speed pact" whereby, if motorists would do their part in reducing

excessive speeds, then he promised to require road authorities to set sensible speed limits. After his move to federal politics no State politician since has dared to announce something so sensible.

7.10 Do Magistrates, in imposing penalties in Court, also order people to attend education/training courses aimed at improving behaviours and attitudes? Do such courses even exist? Have road authorities devoted any resources to researching and developing (or subcontracting) such courses?

7.11 Greatly expand driver education programs. The old argument against these is that the new-found skills merely encourage attitudes of being willing to take more risks, and the net benefit on road safety is nil. However preventative/persuasive type of education sessions can be performed and can be very useful. When I was Road Safety Manager, W.Region, Penrith Police Sgt John Imeson ran sessions voluntarily in evenings. His audience included young offenders and 'about-to-be-offenders' referred to him by youth and community services etc. Even though this was not in my RTA region, I supported towards his program. His format was four evening sessions with guest speakers from the Ambulance Service, Fire Brigade, etc even a Juvenile Magistrate, as well as road trauma victims in wheelchairs. He was very successful in breaking down alienation between lower socio-economic youth and Police and in developing better attitudes to road safety etc. Some of them could not read, and were helped by him to get their driving licences, which greatly improved their employment prospects and reduced the probability of a life of crime. However this program was not favoured by others in the Police force or RTA and lapsed when John Imeson retired. It should be revived!

7.12 Just as we require Learners to spend many hours driving, also require those who make up the road rules and points systems to get out of their air-conditioned offices and spend hours in a Police car in the practicalities of enforcement and human behaviour. Let the bureaucrats face the frustrations and abuse that Police receive due to the pettiness of some of the speed zonings and other regulations.

7.13 As well as P and L plates introduce a "W" plate, where a person has lost their licence and is permitted to drive a vehicle ONLY by the shortest practicable route to and from work.

7.14 Require new vehicles built after (say) 2015 to have 'black box' speed etc recorders like occur in aircraft to enable crash investigators to accurately assess vehicle speed and other parameters (e.g. sluggish steering wheel micro-adjustments that typify fatigue) that occurred shortly before the crash.

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9a Monash University accident Research Centre MUARC Report No. 197, 1999

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10 http://www.socionomics.net/learn-about-socionomics/ Socionomics Institute.

APPENDIX ONE – Summarising data from Office of State Revenue website and Annual Reports.

	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12
Excel spreadsheets www.osr.nsw.gov.au									
School zone offences issued by NSW Police			0.4	2.4	3.0	3.3	3.4	2.6	*2.6*
Safety camera notices (RTA) redlight						0.4	16.9	43.1	*43.1*
Safety camera notices (RTA) speed						0.0	5.2	9.3	*9.3*
Fixed digital speed camera (RTA) notices			33.4	39.9	49.2	41.2	47.0	33.5	35.2
Fixed digital speed cam. (RTA) n's school zone		53.7	0.0	2.0	30.6	22.7	24.1	18.6	16.9
RTA mobile speed camera notices								1.6	3.6
NSW Police-issued speeding notices		57.1	54.2	54.3	48.5	50.5	60.8	61.1	56.8
Seatbelt notices issued by NSW Police		5.7	4.6	4.7	4.5	4.6	5.1	5.6	5.3
Redlght infringements detected by camera			14.0	13.0	11.6	9.2	9.9	19.1	26.2
Speeding infringements detected by camera			33.0	41.9	79.8	63.9	71.0	58.9	64.1
this first 116.5 is a dummy for graph					top right 3 cells are guesses for graph purposes				
Totalling Excel spreadsheets	*116.5*	116.5	139.7	158.2	227.1	195.7	243.4	253.5	263.1
OSR Annual Reports (I add up bits)	124.6	193.7	165.8	196.6	234.5	222.5	242.0		

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