A report from the Safe Speed road safety campaign:
http://www.safespeed.org.uk

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Side effects of speed cameras and speed camera policy

The law of unintended consequences bites back

Executive summary

Department for Transport claims that speed cameras have been successful in as much as they have led to 'substantial' road safety improvements. With the '4th year report' published 15th December 2005, they admitted for the first time that the benefits claimed had been very considerably over-rated due to previous neglect of a statistical bias called 'regression to the mean'. Appendix H of that report contains a fair estimate of regression to the mean effect, and concludes that 75% of the benefit previously claimed for reductions in killed and seriously injured crashes was a statistical 'blip' and not a genuine benefit.

Nevertheless, the 4th year report proudly proclaims that speed cameras are saving '100 lives per year'. Examination of the text reveals that this figure is derived before adjustment for regression to the mean effect has been applied. Applying the correction revises the estimate to around 25 lives per year saved. However, various factors still have not been accounted for.

The most important neglected factor – or rather series of factors – are the accumulated negative side effects of speed cameras and speed camera policy. Many of these side effects apply across the entire road network.

In this document we present a list of 40 of these negative side effects for the first time. It is intended to be a wide ranging list, and as such includes minor side effects as well as major ones. These are not just side effects of speed cameras themselves, but side effects of speed camera policy. Even with 40 items in the list we doubt that it is comprehensive.

Many of the side effects bear directly or indirectly on driver quality, and this is a very serious concern because driver quality is actually our most precious – and most fragile – road safety asset.

It is virtually inconceivable that the annual loss of life from the side effects is under 25 lives per year, so we immediately conclude that the overall effect of speed cameras has been to make road safety worse and to increase the number of deaths on our roads.

Examination of long term trends in road safety risk values reveals a substantial recent departure from trend. This loss of trend is astonishingly well correlated with the growth of speed camera fines. In fact if the previous trend had been maintained, national road deaths would be under 2,000 per year by now instead of 3,200. We are trailing expectation by about 1,200 lives per year – a huge effect sometimes termed 'the fatality gap'.

We believe that the fatality gap is mainly due to the side effects of speed cameras and speed camera policy.

So far from the official claim that speed cameras are saving 100 lives per year, speed cameras and associated policy are actually costing over 1,000 lives per year. No wonder we are calling for speed cameras to be scrapped.

Our petition to 'scrap speed cameras' has gathered over 17,000 signatures in a month. http://petitions.pm.gov.uk/scrapcam

Introduction

British roads have long been more or less the safest in the world. The current fatality rate is about 1 per 100 million miles. Considering the potential danger, and considering occasional extremely reckless behaviour (included in the risk figure) this is a truly remarkable achievement.

At the centre of this achievement is skilled human behaviour. We know – logically – that this must be true because if we stop controlling our vehicles for even 20 seconds a crash is virtually inevitable.

The frequency of high severity crashes is a measure of the quality of our road safety system in general and an excellent measure of driver quality in particular. Driver quality can be defined in terms of skills, attitudes, beliefs and responsibilities.

Evaluation of changes in driver quality from the overall results is complicated by the following factors

- Growth in traffic
- Ongoing improvements in vehicle engineering safety
- Ongoing improvements in road engineering (black spot treatments etc).
- Ongoing improvements in post crash care and rescue
- Ongoing reductions in pedestrian activity
- Traffic habituation (knowledge, expectation and experience of traffic)

These factors, backed by no great change in average driver quality, led to a reliable and highly predictable risk reduction of between 5% and 7% per annum from 1950 until 1994. Since 1994 the rate of reduction of risk has slowed and between 1998 and 2003 only amounted to 0.8% per annum – about 1/8th of the expected rate of improvement. 2004 saw a highly creditable, but unexpected and untypical fall of almost 9%, but from 2004 to 2005 the risk value only fell by 0.9%.

In 1992 the first speed cameras were tested on British roads. The tests were deemed a success and from 1993 speed cameras were rolled out progressively. After 1994 the departure from long term risk trends first appeared.

No one could sensibly argue that speed cameras and supporting policies have not come with wider changes to the ways that our roads are used and policed. These side effects of modern policy have not been officially studied.

Side effects on the relationship between police and public are widely reported and were a leading item of concern at a recent Police federation conference. We have all seen drivers behaving strangely and unpredictably in the immediate vicinity of speed cameras.

But we are certain that there's a vast minefield of serious side effects that strike directly at core road safety values and at average driver quality.

The official headline claim in the most recent report into speed camera effectiveness indicates that '100 lives per year are being saved by speed cameras'. Examination of appendix H of the same report reveals that this figure includes a large overestimate due to a statistical bias called 'regression to the mean'. The estimates in appendix H make it clear that the 100 lives per year should be actually be about 25 lives per year, once the statistical bias has been corrected.

If the total of all the side effects cost more than 25 lives per year then speed cameras are making road safety worse. We believe that the side effects are costing about 1,200 lives per year, mostly though damage to cultural values.

It is virtually inconceivable that the side effects are not costing 25 lives per year on our road roads, and that means that speed cameras actually make our roads more dangerous.

The central problem is that speed cameras affect drivers' management of risk and drivers' management of risk is the foundation on which road safety is based. It's really not going too far to say that speed cameras have changed everything. They have changed the things we pay attention to and the things we regard as important.

Speed camera side effects catalogue

1. Road safety culture damage

Although it is not much talked about in road safety, cultural values at very much at the heart of any safety system. However, in industrial safety, developing and maintaining a safety culture is considered central to reducing risk. Unfortunately nothing in modern policy is helping to build a sound road safety culture. The side effects listed here are actually causing severe damage to our once good road safety culture. Our previous good safety culture was a central component in achieving the safest roads in the world.

Direct and indirect effects on driver quality

2. Drivers' general attitude to driving is worsened.

One of the key factors that identifies a low risk driver is having a good attitude. A good attitude comes from taking responsibilities seriously and goes towards allowing safe margins for error. Drivers with a good attitude learn from their mistakes and don't take safety for granted. There's a significant risk that excessive speed enforcement is having a general negative effect on drivers' attitudes.

Systematic changes in priority

3. Reduced roads traffic policing

Road traffic policing has been in steady decline in the speed camera era. It is sometimes argued that speed cameras have nothing to do with the accepted decline. We blame policy and point out that the same policy makers have caused the rise in cameras and the decline in roads traffic policing.

4. Speed management replaces road user quality management

The advent of speed cameras steadily taking the place of traffic police has had the inevitable effect of changing the balance refined over the years by competent police forces to place greater emphasis on speed limit compliance.

5. Speed enforcement replaces sound road safety engineering.

Slapping a camera up was almost the Pavlovian response to a couple of accidents in the same stretch of road. What used to happen pre-camera era – and what must happen again as we recover – is that road engineers examine the root cause of the accident or hazard and orchestrate a means to reduce/eliminate the hazard or make it much more visible.

Side effects of lower vehicle speeds

6. Risk Compensation 1 - motorists

Drivers may follow closer or drive more aggressively to preserve personal subjective risk levels when forced to travel at a speed significantly lower than their optimum safe speed of progress for the conditions..

7. Risk Compensation 2 - motorists

Drivers may pay ‘just enough’ attention to preserve subjective risk levels at any speed. If speeds are lower, then attention is lower. This is very dangerous if it is punctuated by periods of complete inattention.

8. Risk compensation 3 – motorists and pedestrians

Slower traffic may create an illusion of safety. This may result in lower levels of care from drivers and especially from pedestrians.

9. Stimulation effect

Less stimulation for drivers (lower work rates / lower information rates) leads to more sleepiness and poorer concentration.

10. Longer exposure to accident risk due to longer journey times.

Some accident risk on the roads is time-based. Where journeys take longer, the time exposed to danger is increased. This effect must be quantified and allowed for. It is especially relevant for "fell asleep at the wheel" type accidents, which are likely to be more prevalent due to reduced stimulation..

11. Reduced rate of driver skills acquisition

Higher driving speeds are a ‘stressor’ that promotes experience learning. Without the stressor it is highly likely that vital experience based skills are acquired more slowly or not at all. Trained Police drivers are frequently heard to say: “You never really learn to drive until you are travelling well over the speed limit.” Of course, that’s not to say that people should be encouraged to driver well over the speed limit. However the effect is certain to be present to a degree in less extreme circumstances. Any reduction in the rate or extent of experience learning reflects directly in reduced average driver skills.

12. Dangerous overtaking of lorries due to ‘HGV40’ enforcement

Having different speed limits for different classes of vehicles on the same stretch of roads, particularly single carriageway roads, and rigorously enforcing the speed limit of the slower vehicle types, leads to “trains” of the slower vehicles and frustration of the faster ones. This can lead to riskier overtakes than would otherwise occur, exacerbated further by the overtaking vehicle also having to be wary of blipping over the limit in the act of passing in case of a camera.

Effects of messages in support of cameras / reduced speeds

13. Responsibility effect 1

Reduced individual driver responsibility in general and for choice of speed in particular, leads to a reduced tendency for drivers to reduce speed when necessary.

14. Priority Distortion 1

Drivers' priorities are distorted. (i.e. speeds are set to legal limits rather than for safe driving reasons). We believe that millions of drivers have come to regard the speedometer as a barometer of safety; it is no such thing.

15. Priority Distortion 2

Maintaining a legal speed may sometimes instantaneously be more important to a driver than observing or dealing with road hazards.

16. False safety beliefs

Messages that imply that exceeding the speed limit is dangerous come with a misleading counterpart – the implication that if exceeding the speed limit is dangerous, then observing the speed limit must be safe. It certainly isn't true, but we believe that most of us are affected from time to time and millions are affected continuously.

17. Oversimplified messages

Modern road safety messages tend to focus on very simple 'dos' and 'don'ts', Stick to the speed limit. Wear your seatbelt. Don't use your mobile phone. But road safety needs sophisticated messages such as. Develop your skills. Learn to better manage risk. Take responsibility for your actions. To some extent speed camera policy is responsible for this oversimplification of road safety messages.

Practical side effects of camera enforcement

18. Driver distraction

Drivers pay less attention to the road ahead because they pay much more attention to speed limit signs, the speedometer, speed cameras and indeed anywhere where there might be a speed camera. While this effect is small in any individual driver, it probably amounts to several percent of total national driver attention. This is a huge hidden danger and, given the size of the population, it is certain that there will be cases where this low level but widespread distraction coincides with incident development.

19. Traffic displacement

Traffic diverts to less safe roads due to enforcement on busy routes. Of particular concern here are dangerous 'thrill seeking' groups of road users. It's known that such use of the roads carries a high risk and it is only reasonable to assume that anyone intending to use our roads in their own vehicles in such a way will actively seek out camera free routes to get their thrills. So the traffic displaced by cameras includes highly risky groups. This may contribute very strongly to an illusion of speed camera benefit and a significant escalation of risk elsewhere.

20. 'Race-away' behaviour

It has been admitted at the highest level that crashes beyond speed camera sites sometimes increase as drivers or motorcyclists 'race away' from the speed camera site and 'crash on the next bend'. It remains to be determined if this effect results primarily from anger or over-excitement.

Crashes caused by enforcement

21. The risk of accidents directly caused by enforcement.

It is well known that, irrespective of speed of free travel, some drivers automatically brake or slow down significantly for a camera. If a speedo check reveals a speed within the limit, but is carried out at the same time as panic braking by the vehicle in front, the gap between vehicles can reduce to dangerous levels requiring severe braking and can result in loss of control and collisions.

22. Injuries caused by enforcement hardware – fixed cameras.

Any street furniture is vulnerable to collision with any road user. Often we see bent traffic light support poles and street lights. Keep left signs are more vulnerable. The extra poles to support speed cameras

are not exempt from such incidents. Given the additional reinforcement to avoid vibration and to render them vandal-resistant they are actually particularly dangerous.

23. Average speed cameras promote speedo obsession

Average speed cameras were promoted to overcome the argument of the blip overtaking being more risky thanks to fixed “instantaneous” enforcement. The side effects are far worse though. People are more obsessed with their speedo in such zones, leading to dangerously low attention spans to the real hazards.

24. Average speed cameras promote close proximity driving

It is highly visible in motorway road works sections overseen by SPECS average speed cameras that vehicle drive in close proximity to one another, both close following and long periods of side-by-side driving are extremely commonplace as vehicles match their speeds to the exact speed limit. Side-by-side driving increases risk because in the event of an incident there’s no escape space.

Legal and societal effects

25. Poorer public / police relationship.

Road traffic policing has already had a clear effect on the public's perception of the police. Many law-abiding people only come into contact with the police over road traffic issues. The blunt nature of the law, with eroded presumptions of innocence, eroded right to silence and absolute offences frequently leads to the Police being seen in a bad light. This degrades the Police’s ability to deal with all crime, and especially means that Police road safety messages are regarded with less respect.

One particular strong contributor are the frequent cases reported in press where it is perfectly clear that the Police cannot obey the speed limit laws either (when off duty, or otherwise unable to avail themselves of their speed limit exemption).

26. Reduced respect for law.

The vast majority of UK drivers regularly exceed the speed limit, and this includes the legislators, Police (without an emergency need) and court officials. When a citizen faces conviction for a speeding offence he knows full well that those responsible for convicting him are regularly guilty of the same offence. The hypocritical application of the law brings it into serious disrepute and the ultimate consequences can only be guessed at. There are many ways that reduced respect for the law can bring new dangers to our roads.

27. Reduced confidence in official road safety messages

The false safety messages surrounding the Department for Transport’s speed camera campaign result in substantial public disbelief and loss of confidence. The opportunity to communicate valuable road safety messages is being eroded.

28. Road user groups are set against one another

Some cyclists and pedestrians are noticeably angry with car drivers because they have been persuaded that ‘exceeding the speed limit is dangerous’ and they know that exceeding the speed limit is commonplace. This growing animosity is very bad for road safety which depends on co-operation and consideration.

29. Reduced interest in road safety and safe driving

Modern road safety is onerous even to responsible drivers. They are being pushed away from an interest in the subjects, rather than invited in. People who are disinterested are less likely to acquire skills, less likely to investigate the subject and less likely ultimately to perform well. While it will certainly be very difficult to determine the road safety consequences of such effects, it should be obvious that they are real and that they are negative.

30. Journeys take longer and cost more.

Most speed limits and speed limit enforcement has little effect on journey times, but there are important exceptions. One such exception is unnecessary enforcement of the HGV 40mph speed limit on single carriageway trunk routes, which can add as much as 35% to journey times for both HGVs and other road users. This loss of economic efficiency ultimately means less money in the economy to invest in schools and hospitals.

31. Reduced incentive to train drivers better.

The more we characterise drivers as “incompetents who must be regulated” the further we move away from the previous “individual responsibility” system of road safety that served us so well, providing excellent reductions in road casualties until about 1993. The present course of speed reduction tends to lead us to neglect the basic sound idea of obtaining improved safety standards by training to improve drivers’ attitudes and road safety culture.

32. More lawless drivers - false number plates, improper registration, no insurance, car cloning etc.

It's obvious that we already have drivers who neglect or evade registration and other legal requirements in order to evade modern dumb speed enforcement. Once they have decided to behave outside the law we suggest that they may well behave in a more dangerous manner, and for example, might be much less likely to stop and render assistance after an accident. They are hit and run drivers in the making.

33. More safe drivers convicted with possible loss of job / home etc.

Whatever way you look at figures, it is clear that the vast majority of modern speeding offences are carried out by drivers who will never be involved in an excessive speed accident. One might reasonably infer that many cases of exceeding a speed limit take place in safe circumstances where no actual danger is caused. The Law has to be subservient to Justice. Applying the weight of law in these cases has serious consequences and sometimes results in loss of job. There probably already have been suicides triggered by the consequences of speeding convictions.

34. Honesty and accuracy in official road safety messages suffers

‘Speed’ has been deliberately demonised in support of speed camera policy. Huge claims are regularly made for crash reductions at speed camera sites, while the very important regression to the mean bias is never accounted for. Department for Transport insists on adding contributory factors for ‘inappropriate speed’ (a driver quality issue) to ‘speeding’ (a legal compliance issue) in order to exaggerate the importance of legal speed controls, and to justify their flawed speed camera programme.

35. Heavy load on Courts and CPS

Some solicitors have become notorious for clearing the name of certain celebrities who have been accused of speeding. This, along with websites such as Pepipoo encourages aggrieved motorists to become recalcitrant, raking over all details and having their day in court. The system is becoming overloaded.

36. Camera overuse is leading to legal challenges to laws. Useful laws may be lost as a consequence.

Sophisticated members of society are mounting challenges to the law surrounding speed cameras. A particular current example is the ongoing challenge to the requirement for a vehicle owner to identify the driver at the time of an alleged offence. At the time of writing we're awaiting a verdict from the European Court of Human Rights (ECHR) in the famous 'right to silence' case. If Section 172 of the Road Traffic Offenders Act 1988 is lost due to this case the Police's ability to act in serious cases of hit and run crashes will be reduced.

37. Public danger, expense and resources consumed by speed camera vandalism

Speed camera vandalism is common. It's possible that cases of vandalism will directly endanger the public. It's certain that such vandalism will take funds from the wider economy with a small effect on funding available for public services including schools and hospitals.

38. A boom in number plate theft, car cloning and neglect of vehicle registration requirements

One of the fastest growing motoring crimes is number plate cloning. A number plate from a car of the same type and colour as the target car is made up and fixed to the target car. Any camera flashes it collects go to the registered keeper of the original car to deal with. Camera based enforcement positively promotes this sort of activity as people come to realise that they might be better off working outside of the system. This in turn consumes significant Police resources which are then unavailable for road safety work.

Evaluation side effects

39. Joy riders, drunks, reckless and lawless drivers unaffected.

If we get to a point where we have figures to extrapolate road safety improvements from speed reductions, it must be remembered that not all road users will be affected by enforcement schemes. Joy riders are in an innocent motorist's car – camera paperwork goes to an entirely innocent person. Drunks are far less likely to be stopped as a result of the substantially reduced police presence. Reckless drivers who operate outside the law – cloned plates and throwaway cars – will not be touched by the cameras.

40. Authorities are reluctant to risk 'proving themselves wrong'.

You would think that the side effects listed here would have been considered and evaluated by the authorities. But they have not been. We believe that this can only be because they consider that the results may prove that flagship road safety policies are ill founded and have failed.

Conclusions

1. The best estimate of the life saving benefit of speed cameras stands at about 25 lives per year. If more than 25 lives per year are being lost due to side effects, then speed cameras are increasing the death toll on British roads.

2. None of the side effects have been officially studied. This is almost unbelievable because we have had speed cameras on British roads since 1992 and it is perfectly clear that there is a wide range of side effects.

3. Drivers gain experience particularly over the first decade after passing a driving test. During this time their average crash risk falls by at least a factor of ten as they gain experience. This subtle process of skills development is potentially extremely vulnerable to false beliefs and distorted safety priorities.

4. The ‘smoking gun’ evidence that the side effects have damaged road safety is that neither road deaths nor road crash hospitalisations have fallen as expected. In fact, if policy had done nothing and earlier trends had continued we’d have about 1,200 fewer road deaths each year by now.

5. Several recent studies propose that the only possible explanation for the failure of road deaths to reduce as expected can only be ‘because drivers are getting worse’. The question of why drivers are getting worse has not been officially addressed. We are certain that ‘bad policy’ is responsible for making drivers worse through side effects.

6. It is known that single vehicle crashes are on the increase, including typical ‘failed to negotiate bend’ crashes. These are very much the sorts of crashes that we would expect to increase if driver quality was falling.

7. Department for Transport claims that road safety is meeting their targets, but this assessment depends entirely on the recorded beneficial trend in recorded serious injuries. Hospitalisation records do not show this trend at all. Road deaths do not show this trend.

8. Speed cameras are blunt instruments (at best) which have changed many things. They have changed the things that drivers pay attention to and the things that they regard as important. They have changed the way that our roads are policed and damaged the relationship between police and public. They have brought the law itself into a degree of disrepute.

9. Speed camera policy has failed. The overall road safety results show very disappointing trends with neither deaths nor hospitalisations falling significantly.

10. The only ‘control group’ study available of speed cameras on British roads shows an increase in crash risk associated with speed cameras at speed camera sites. (TRL595)

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Contact:
The Safe Speed road safety campaign
http://www.safespeed.org.uk
Email: psmith@safespeed.org.uk
Tel: 01862 893030