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cc **Andrew Smith at the DfT** and others

Seriously Flawed Claims of Speed Camera Benefits

Dear Mr. Hammond,

Thank you for your detailed response of 1st May including in particular PA Consulting's Handbook for speed camera organisations.

As this will inevitably be a long letter I will start with a summary, after first mentioning I have spent thousands of hours over the past twelve years studying road safety data and methods, including more than once proving the DfT to have been very seriously in error on related matters - see my web site www.fightbackwithfacts.com. All documents relevant to this matter are available at **http://www.fightbackwithfacts.com/humberside-safer-roads-false-claims/** via a list at the bottom of that page. The numbers in brackets refer to those document numbers.

To avoid going into unnecessary detail - though the main issues are essentially very simple - I will assume from your position that you are thoroughly familiar with these subjects. However if any part of my analysis is less than clear please ask me for clarification.

In Brief

1/ Safer Roads Humber (SRH) recently published their report for 2010/11 (05, 08) that makes seriously exaggerated (and given the context, dangerous) claims of speed camera effectiveness at their sites and the "costs" they had supposedly prevented. The claims were obviously absurd because they (a) **assume that all observed reductions at camera sites are due to cameras** and nothing else (b) **treat as cash** the notional and hypothetical DfT figures for "value" of pain and suffering avoided and (c) **include the DfT's ludicrous figures for "lost output" of road casualties**, when one of the most basic rules of economics, that output = demand, ensures that any such output lost by a casualty is made good by others.

The casualty reduction claims due to cameras were in any case ludicrous they are **far in excess of the proportion of accidents ever recorded (Stats19) as involving, let alone being primarily caused by, speeding** in the first place. And when speed reductions achieved were often modest if not derisory..

2/ I wrote to **SRH** repeatedly (02,07,11,12,14,18) pointing out in detail that **their claims could not possibly be true**, either in terms of numbers of casualties or their costs, asking that they be withdrawn but they **have repeatedly refused to do so** (03,06,13,17), most recently on 8th May.

3/ While never challenging any of my detailed arguments showing how their figures were clearly nonsense, they insist that they follow the DfT's recommendations and "methodology" (a fancy name for what amounts to no more than simple arithmetic). I need not repeat my arguments here because they are all set out in these documents.

4/ It was for this reason that I contacted you on the 16th of April asking for details of **the recommendations SRH claim to be following** and you replied on 1st May (15,16)

5/ Unfortunately it then became clear that **SRH's** claims are nonsense because the Handbook's advice (**pg. 31** ***F. SITE EFFECT****) in document 16) on how to assess* the data, **<u>is itself obvious nonsense</u>**, for the same reasons! I set them out in more detail below:

6/ As I am sure you will agree, policies and spending decisions in all areas of Government need to be based on sound analysis of good data, but when, as in this case, often incomplete and/or unreliable data is analysed in absurd ways to give ludicrous results, it is likely that **these decisions will be seriously flawed and that as a result lives and limbs will be lost. <u>This cannot be allowed to continue.</u>**

7/ The **statutory duty of ca**re owed by public servants **such as SRH** to the public they serve extends not only to **not** publishing ludicrously false claims in the first place (arguably a breach of the Perjury Act 1911 and perhaps others) but **also to withdrawing them when they become aware that they are wrong.** Indeed, there is ample case law to confirm that failing to act when necessary can be just as serious an offence as acting wrongly.)

8/ I have repeatedly warned SRH that it is not acceptable that they excuse their failures by claiming that they are only following DfT instructions - they have a duty to the public to correct obvious errors . As they have again refused I will now **file a formal complaint with the police of Misconduct in a Public Office** and other possible offences.

9/ Although many of Partnerships web sites no longer quantify their claims of the benefit their cameras supposedly provide, for all I know **others** may still be doing so. It is therefore most important that **not only SRH** but all other such organisations **are advised promptly that the Handbook's "methodology" is seriously flawed at least in respect of estimating accident and casualty reductions, that the DfT's valuations of accidents avoided are very seriously overstated and that <u>any and all claims based on these methods and figures are invalid and must be withdrawn.</u>**

10/ Please confirm that you and your colleagues will give these matters your urgent attention and that those who use the Handbook as a basis for such claims are told promptly not to do so until revised and corrected information is available.

<u>In More Detail</u>

a/ Why do accident numbers change ?

"I say, I say, I say! On Monday there was a fatal accident outside my house, butMonday night I put a garden gnome on the verge and there was no accident on Tuesday! That £10 garden gnome has saved the country £1.6m - so we must invest in lots more of them!"

Ludicrous? A candidate for the Funny Farm, or for a stand-up spot at the Apollo? The proposition is of course utterly absurd - but **no more absurd than how**, albeit over a longer time scale and with larger (though still statistically small) numbers **Safer Roads Humber** and indeed PA Consulting assess the effectiveness of cameras!

Back in the real world, as any novice student of road accidents soon understands, **reported** accident and casualty numbers at any particular location fall - or nor infrequently rise - because of:

(A) **<u>Random chance</u>** (significant at individual sites, less important when averaging results of many sites over longer periods).

(B**) <u>Long-term trend</u>** - normally downward for fatal and serious accidents, more variable for slight. Trend effects include:

> **i/** Improving active and passive vehicle safety - better brakes, tyres, electronic systems, ABS, structural integrity, road layout, design and surfaces and of course road works, etc.
>
> **ii/** Local changes in employment and other factors resulting in local changes in traffic volume relative to the national average. Also by economic boom or bust nationally or locally.

iii/ In terms of casualty outcomes, better medical skills and faster response.

iv/ Sl**owing rate of traffic growth -** down from 10% p.a. in the late 1940s to 1% p.a. in the early 00's and significant falls from 2007. (From 1950 to 1993 fatalities per vehicle mile fell overall by a factor of 11, a compound annual rate of 7% pa).

v/ Falls in reporting levels of non-fatal casualties. The DfT's assessment is for example that from the early to the late 00's average reporting levels of Serious Injuries fell by 24% from 1 in 2.7 to 1 in 3.5. Indeed in their 2008 Report the Transport **Select Committee stated very clearly that they could no longer believe the KSI figures in police reports** for this reason, and as pointed out by the British Medical Journal (see web)

vi/ Inevitably subjective differentiation by (usually non-medically trained) police officers between Serious and Slight injuries, at risk of bias, even if subconscious, towards hitting KSI targets and camera objectives. Because there are five times as many slight injuries as serious, a 5% reduction in Serious achieved by moving the boundary shows up only as a 1% increase in Slight.)

C/ <u>Regression to the Mean</u> (or in this case to log term trend) - the way in which accident and casualty numbers tend to fall back to normal levels or trends after the rise which led to the camera being installed. Also known as "**selection bias**" in that by selecting sites that have unusually high accident levels, numbers are then likely to fall. In the same way, selecting sites with no accident record history can of course only see increases. This effect, though impossible to measure directly due to so many other confounding factors, and although varying widely between different roads, can be very significant, According to **Appendix H of the 4th Year Report**, it accounts for **60% of observed fall in KSI, 20% being due to trend and only 20% to camera effect**. Even that however fails to allow for perhaps **5% due to drivers diverting to avoid cameras** - see next item. Yet SRH and PA claim 100% for cameras!

D/ Camera effect (if installed, if any) Note however that some drivers divert to avoid cameras. Indeed SRH's data (09) shows an overall 5% reduction in traffic at their sites when there was little change nationally, suggesting that **5% of the observed falls** at sites might simply have been those drivers' share of **accidents having been diverted to other roads, not eliminated.**

<u>SRH's Absurd Claims that cameras alone brought about those reductions</u>

Despite all of the above effects being well known and understood (though not necessarily accurately quantifiable quantifiable) **SRH's claims of camera benefits completely ignore all these other factor and claim credit for their cameras for the whole of the observed falls -** despite a **national fall in KSI of 25%** over the same period when 985 of our roads are not covered by cameras!

If SRH were to be believed, then the engineers and car companies spending billions to improve vehicles, the civil engineering companies improving our roads and the medics improving their skills and response speed are all wasting their time - and out money - because SRH's cameras do it all! <u>This is abject nonsense and it must stop!</u>

If you wish to check how SRH calculate their figures and how absurd they are, the details are all in my letters of complaint to them (02,017,11,12,14,18).

<u>Absurd "Costs Saved" Figures</u>

I can find nothing whatever - not even a £ symbol - in the handbook about estimating the "costs" supposedly saved by cameras, so it seems that SRH claim in its 2010/11 report (document 08) for *"£73,223,760 saving in terms of fewer people killed or seriously injured*" (complete with its ludicrous 7 significant figure accuracy for a figure which is little more than a guess multiplied by an estimate and divided by a rough approximation and in any case a moving target!) is of their own doing - though I have seen similar nonsense in other reports.

Similarly their claim in their Press Release (05) announcing their report that:

*"Government research shows that every person seriously injured costs society **£178,160**. This is the cost to the emergency services, health services, loss of earnings and emotional costs to the person, family and friends. In financial terms, this **equates to a saving to society** of more than £73 million since the partnership began*

is very seriously misleading, not only because cameras cut far fewer accidents believe (if any) than they would have us but also because the "Government research" they mention - i.e. DfT estimates - are largely nonsense. I need not repeat here in detail I have published elsewhere (http://www.fightbackwithfacts.com/bogus-dft-values) but in simple terms, the DfT's notional, highly subjective and of course rather variable estimate of £1.6m as the value (not cost, which is quite different) of a fatal accident comprises three main parts:

1/ About **£20,000** for damage, medical attention etc. To an extent, this figure is overstated in terms of the real cost to the State because some of the cost is recovered indirectly in the form of tax on salaries and profits, in unemployment pay did that work not exist and also as VAT charged on goods and services.

2/ About **£1.1m** for "*emotional costs to the person, family and friends".*The important point about this subjective, arbitrary and theoretical figures is that it is **notional, and not real money**. It may be a "value" but it is neither a "cost" nor a potential cash saving as SRH would like us to think. As the National Audit Office has confirmed it is quite wrong to take such a figure and use it in accounts as if it were real money saved for the taxpayer.

3/ About £550,000 for "*lost output*" (not "lost earnings" as stated in the quotation). Whoever prepared that estimate was deluded, for two reasons. The first is that when someone dies - on the road or anywhere else and for any reason for that matter - their contribution **both to output and demand end at the same time, leaving GDP per head, which is what matters, unchanged** (on average of course). Similarly, when someone is injured and unable to work, **their** earnings might be lost **to them**, but **their loss is someone else's gain** when others take over their work, Equally, their contribution to national output might fall or stop, but if it does someone else takes over to meet demand. Absolutely basic economics!

See for example **http://www.fightbackwithfacts.com/bogus-dft-values/** for a more detailed analysis, but whether it is fatal, serious or slight injuries the actual cash cost to the State of accidents is only a tiny fraction of these hypothetical figures. **It is therefore utterly unacceptable that SRH seek to justify their existence not only on the basis of largely spurious reductions in casualty numbers but then compound the offence by using largely spurious figures for cash supposedly saved.**

<u>**PA Consulting's Role in all this**</u>.

PA Consulting were responsible for **many unacceptable, irresponsible and unforgiveable errors of analysis** in their plans for mass expansion of cameras from 2000 under the Hypothecation Scheme (died April 2007) Space does not allow me to cover them all, or the errors of analysis in the reports on the 8 area trial and the 1st to 4th Year reports, but essentially, as I understand it, they and (others at University College London):

(i) Completely ignored Regression to the Mean from the first trials right through to the 3rd Annual Report.

(ii) When forced by vehement complaints to pay lip service to Regression to the Mean in their 4th Year Report, astonishingly and unforgivably, they **made their headline claims without allowing for Regression to the Mean -** despite quantifying its significance in their Appendix H**!**

(iii) Until now I was unaware of the detail of the 2005 Handbook for Partnerships (16) and its **Section F which not only ignores Regression to the Mean and traffic diversion - but even ignores long-term trend too!** <u>**This amounts to unbelievable incompetence**</u> **- or perhaps wishful thinking and self-justification. The proof that they do ignore them, and so claim as camera benefit the whole of the observed reduction is as follows** (and as also set out in my complaints to SRH)

<u>**a**</u>. The % figures in the "**Effect**" column (2nd from right) are in all cases the **% change** from the average "**Annual**" figures in the "**Before**" period (7th column from right) to the average "**Annual**" figures in the "**After**" period (3rd column from right).

The figures are of course **mathematically correct** (except for two absurd blunders, see below). But **to refer to those % changes as the "Effect", implying camera effect and nothing else** is both bizarre nonsense and unacceptable.

b. Similarly, numbers in the right hand column are mathematically correct in that they represent the observed reductions at each site - but to refer to them as "**Avoided**" with the implication that cameras and nothing else achieved them is **equally wrong and dangerously misleading.**

c. I note in passing that in Lines 4 and 11 in which the "**Before**" collision numbers were **Zero** (making me wonder why cameras were put there in the first place), they rose from **0 to 2 (0.5 average) and to 1 (0.3 average). But what is truly bizarre about them is that the percentage change column shows these as 50% and 25% changes respectively, when as any fule knos, both were infinite**! (I recognise of course the problems that arise from infinite numbers upsetting calculations, but that is no excuse for such nonsense).

d. The statement beneath the table of figures that "*The Camera Site Effect report allows you to rank sites on the absolute and annualized number of collision and casualty incidents as well as the effect in reducing these"* is correct in terms of what is mathematically possible, but misleading **in terms of what the rankings then indicate: for example, a** site showing a **100% decrease from 1 to** 0 is **not better than a site showing a 66% decrease from 3 to 1 but worse** - in terms of benefit/cost ratio, which is surely what matters. The danger here is that innumerate people at Partnerships - I have corresponded with too many of them - risk rating sites on the basis of % changes instead of numbers. **The document appears to have been written by someone who has some grasp of arithmetic but no understanding whatever of accidents or statistics**.

I can say with certainty that had anyone I employed in my own company made such errors he his feet would not have touched the ground on his way out, other than afterwards to bend down to pick up his P45! No private company would survive if it continued to employ people capable of such nonsense.

Discrepancies in PA Consulting's contribution to your reply to me (document 15)

Q1/ Details of how their overall calculations are to be carried out, including in particular the methods use to estimate casualty numbers had cameras not been installed.

A1/ *I do not have the database or code to hand. However I understand the calculation performed in the database reflected the rules for sites set out in the handbook (which has been previously released under FOI). These were, I believe,*

Static - Within 400-1500 metres of the camera site
Mobile - Within 400 and 5000 metres (can be linked into a route) of the camera site
Time and distance cameras – Within 3000 and 10000 metres along the enforcement route
Red-light – Within 50 metres of the camera site

Back to Reality.

I asked the question because DRH had told me that they used DfT 'methodology" to calculate camera effects and I initially assumed that there was some sort of complex theory based on statistical evidence of the various factors involved, including perhaps the different characteristics of different sites, - as indeed the above reply suggests.

In passing I note that was already aware of course from my analysis of 4.7m accidents and the spread sheet analysis (21) that the whereas trend tends to be much the same across the country, average RTTM varies enormously from congested relatively low speed urban areas - London being the prime example - to remote areas such as North Wales and rural Scotland. The only possible reason for such wide variations - from10% to 75% - is **not that drivers and vehicles are much different in different parts of the country** but that the mix of busy, congested, dangerous urban roads to empty, safe, rural roads is very different. In other words if RTTM is to be taken into account it needs to be taken into account on the basis of RTTM at that sort of road with that sort of traffic volume and hazard - a complex task of course, if not impossible.)

However while waiting for your reply I looked at the SRH report's data (document 09) to see if I could get a feel for what methods were being used. I was **utterly astonished - and appalled -** to find that, as I have already set out, **no such methods of adjusting for confounding factors is used at all -** they simply ssume that all reductions are due to cameras and nothing else! As indeed PA Consulting tell them to do!

That being the case, why did PA Consulting provide the utterly misleading reply suggesting complex methods that they did not have to hand to copy to me? My question was perfectly simple - how are Partnerships told to estimate accidents and casualties had cameras not been installed? The simple and correct answer would have been that they are told to assume that, without cameras, accidents and casualties would have continued at the same level indefinitely! What nonsense

Q2/ The above details to include how the contributory factors identified above (and any others of which you are aware) are taken into account.

A2/ *The question seems to imply that the database automated this. As I understand it, the database recorded evidence collated by Safety Camera Partnerships (for example analysis of contributory factors in STATS19 reports, speed surveys, road engineering insight)*

Back to Reality

As before, this answer too is nonsense - none of these other contributory factors **are taken into account** as Section F of the Handbook makes clear! Why was I told otherwise? (I have not read the whole of that long Handbook, though I have skimmed through most of it. Nowhere did I find any indication whatever even that Trend is to adjusted for, let alone RTTM. If I am mistaken please tell me where I would find it).

Q3/ Whatever data is provided by the DfT to those organisations to facilitate their calculations, including accident, casualty, traffic volume and other related data. I already have all available accident and casualty data since 1985, so do not need that substantial quantity of data again, rather I need the summaries, averages, totals and trend figures as supplied to Camera Partnerships, Police Forces and similar .

A3/ DfT did not, as far as I am aware, provide any data. The local Safety Camera Partnerships collated the STATS19 data from police/their local authorities. Many of the local safety partnerships have produced their own evaluations which might be of more use.

Back to Reality

I asked the question because in one of their brief replies SRH told me that they use data provided by the DfT. I had wondered whether that data might have included national trends and traffic volume data, essential for adjustment of local figures, but as I now see, they ignore them so it remains unclear why they told me they used such data.

<u>Finally</u>

What initially seemed to be a problem caused by **local incompetence has now become a much larger and much worse can of worms -** that not only Humberside, but also many, if not all, other Partnerships, and now **the DfT itself and PA Consulting are under the delusion that all observed calls at camera sites are due to cameras and nothing else!**

As I wrote previously, **this nonsense has to stop**, and I would be obliged if, having acknowledged receipt of this letter, you would then come back to me promptly to advise what the DfT proposes to put this right and bring some sort of sanity back to analysis and decision making.

Yours sincerely

Idris Francis