



Signs and fines: a rational ergonomic approach to speed limits

by John Campion

Few things inflame the passions of motorists so much as speed limits and their associated cameras and fines and few people these days are left unscathed. But debate between the pro-camera and anti-camera lobbies is usually sterile. The former point to lives allegedly saved and the latter to the unfairness of being caught for driving at what they feel is a safe speed. Cameras are often seen as a cynical means of raising revenue rather than ensuring safe driving.

Speed cameras may save lives, but that fact alone cannot be allowed to determine policy. Benefits, as with all policies, need to be balanced against costs. Costs consist, not only of the financial costs of installing and running the enforcement system, but also the inevitable frustration and anger caused to the motorist. Frustration and anger are undesirable effects in themselves but they also have knock-on effects that are invisible.

Frustration and anger are caused by normally intelligent and safe drivers being forced to drive unintelligently and unsafely. This is because speed limits, being very crude instruments, are inevitably to some degree arbitrary; that is, they bear no relation to the speed that it is intelligent and safe to drive at, at any particular time. This point is especially pertinent at this time of year when dark mornings and evenings, and poor weather conditions significantly increase accident rates, for both drivers and other road users.

Intelligent safe drivers set their speed using intuition as to what constitutes safe driving using the flow of information within the visual field coupled with their experience. They tune their speed in subtle ways to match prevailing local conditions such as lighting, weather, traffic density, the presence of special hazards and so on. Speed limits, in contrast, force a pathological state in which drivers are forced to reject this rich information source and drive on instruments. This is both humiliating and intrinsically dangerous.

The diagram on the opposite page compares the legal and intelligent speed limits for a simple hypothetical (but realistic) small town set in countryside for two different times of day. The grey areas indicate discrepancies between the two limits. Areas below the legal speed limit line represent situations in which the driver is 'virtuous'; areas above the line represent situations in which the driver is 'sinful'. Both indicate situations in which the speed limit is arbitrary. This is most of the time, which cannot be good.

The policy of the pro-camera lobby seems to be to introduce greater numbers of increasingly stringent camera-enforced speed limits. 20mph limits in town centres are already in place and still more stringent

restrictions are mooted. But all this does is to increase the degree of arbitrariness of the limits and the degree of frustration of drivers, when what we clearly need are speed limits better tuned to the reality of intelligent and safe driving. If we are not to abolish speed limits altogether, this can only be achieved having limits that are more sensitive to prevailing local conditions.

The first necessary step is to find a means of quantifying the degree or arbitrariness of any given speed limit; the amount of grey area in the diagram. The benefit of using this measure is that it accounts for magnitude of any arbitrariness as well as the distance over which any arbitrariness exists. So that speed limits in different situations can be compared, the area needs to be converted from a raw score into a proportionate one. This may be termed an Arbitrariness Index or AI.

AI may then be determined for a number of standard conditions, giving an AI Profile or AIP. This, of course, presupposes that some method of developing a reliable intelligent speed limit profile is first developed. I envisage that this would be done at least initially using panels of normal safe drivers. Since this would be labour intensive it may be that eventually profiles could be constructed using a set of standard environment features derived from these.

Studies could then be undertaken to determine the maximum AI that was deemed reasonable and tolerable by the normal safe driver and this would be used as a target for designing new speed limit signage and enforcement methods. These could be used initially to modify existing systems but eventually to design completely new ones. Studies could be undertaken to identify ways in which such systems could realistically be implemented. Some obvious candidate measures are:

1. Remove all legal speed restrictions.
2. As (1) but have advisory speed limits only.
3. As (1) or (2) but log speeds automatically and take speed into account only if there is an accident or other dangerous incident reported.
4. Make speed restrictions time sensitive as is currently done with bus lanes.
5. Make speed restrictions variable as is currently done on the M25.
6. Taper speed restrictions using count-down

signs as is currently done with motorway exit signs.

I sense, though, that the pro-camera lobby fear that easing restrictions would immediately result in a free-for-all with dangerous driving becoming rife but I think this is unlikely to happen. Observation and commonsense suggests that the great majority of drivers wish to avoid accidents and drive intelligently and safely. Current enforcement policies probably catch a very large number of safe drivers for every one dangerous driver. They also generate pathological behaviours such as driving on instruments and slowing for the cameras and speeding up in between them. Such behaviours are not conducive to the development of a mature safe driving community. I firmly believe that if you treat people as responsible adults, they will tend to behave as such.

