



Lightmare

Forever in search of new USPs and saleable safety features, manufacturers have latched onto the dangers of night driving and are constantly trying to outdazzle each other with their high-tech headlights. But what about the driver or rider unlucky enough to be coming the other way? Driver training consultant, Howard Redwood, and Ken Perham, a licensed London taxi driver, who has operated solely at night for the last 36 years, examine a growing road menace and ask whether it's time for the law to be updated

When we think of driving and driver safety, we don't immediately think of the safety aspects of driving in the dark. Most thoughts go straight into what the perils are in the hours of daylight because that is when most business and commerce takes place and when the roads are generally busier. However, we live in a 24/7 world, whether we like it or not, and at the time when most of us have knocked off work and are winding down, or in bed asleep, the roads still have to do their job of moving freight and people.

Logical efficiency

Although the traffic volume is generally lower after the rush hour has finished, should we be questioning the logistical efficiency of the roads at this time? Road Safety statistics reveal the frightening fact that 40 per cent of road traffic collisions take place in the hours of darkness. Believe it or not, the reasons for the figures are inconclusive, but studies on sleep deprivation made jointly by Professor Horne at Loughborough University and the Transport Research Laboratory (TRL) are able to account for part of the casualty rate. The exact figures are impossible to assess because a corpse from a single occupancy sole vehicle collision (SOSVC) is unable to explain its part in any incident, but figures from 1987-1992 suggest that 16 per cent of accidents are sleep deprivation orientated. What about the other 24 per cent? Decreased visibility is the most obvious and the misuse of alcohol or drugs is also prevalent.

The misuse of alcohol and drugs has been researched and advised on by nearly every interested party dealing with road safety across the world, and anything added here will just be a repetition of well trodden statistics. The argument of decreased visibility is another enemy. To unravel it we must go back again to the concept of perception.

Perception

As a driver trainer, I often ask the pupil or client to explain what is meant by 'inclement driving conditions'. Their perception of this always results in the obvious replies of rain, sleet, snow, high winds etc. Rarely do they ever mention the situation of low sunshine, and nobody ever mentions 'driving at night'. Driving into low sunshine and driving towards on-coming headlights have remarkable similarities.

Let's go to a daylight example. You are driving along a road towards a low sun and it is dry. The sun visor is being used, but in this particular condition, it is relatively ineffective. On-coming traffic is masked by the bright light ahead of you, and appears from a darker 'void-like' setting meaning that the driver is unable to perceive it in its entirety until quite late. This distance and perception is improved if the on-coming vehicle is using 'daylight running lights', and if your windscreen is clean and clear. (Nicotine on the inside of the windscreen is proven to exasperate the depth of vision in this scenario because the bright sunlight striking the glass gives the impression of fog). The whole situation gets >>>



>>> worse when the low sun is glaring off a wet or damp road surface, causing a lot more difficulty when making judgements of position of on-coming vehicles and the course of the road ahead. The pupils contract due to the background light of the sun, thus masking the object in the foreground.

Now, let's look at the night time situation, where we are driving in the dark on a single carriageway road. First of all, we have no form of 'uniform' light. Our eyes are constantly adjusting to the street lamps (one intensity) above us, the tail lights (another intensity) in front of us, and the variable intensity of the on-coming headlights. This becomes all the more difficult for the brain to assimilate when there are wet conditions, because we then have to deal with the secondary light of glare and reflections from puddles on the road, as well as a certain amount of diffused light from the rain on our windscreen. With the headlight scenario, the pupils are made to contract by the on-coming lights in the foreground, thus masking other less well lit objects in the foreground or background due to the poor ambient light surrounding the headlights. Are these not examples of inclement driving conditions? They certainly require as much concentration and extreme care as a high wind scenario. So, why do we not perceive night driving to have the risks which inherently exist, especially on unlit, single carriageway roads, where the distance between two approaching cars, at speed, is usually less than a metre!

Variable light intensity

Despite several uses of the word 'light', what we are really talking about is the reduction of visibility due to variable light intensity and it is the word intensity which is where our perception problems begin. We are referring to 'strength of light'. An object does not necessarily become clear due to its size. It will only be seen if it is being searched for, or if it is prominent in comparison to other objects around it or near it. A cyclist, with lights, should be seen because he is lit, but only if the lights are brighter than the surrounding ambient light. If you now put a car behind with dipped head lights, then the cyclist's lights lack contrast to the dipped headlights due to ambience. Flashing lights are even worse, because they disturb the brain pattern. The assimilation of depth of vision is upset, and therefore the distance of the target is difficult to judge. This is why the Highway Code insists that any cyclists riding with a flashing light must accompany those flashing lights with an alternative steady light, so that the depth of vision of the driver of other traffic can assimilate the spatial awareness in the dark.

The Ministry of Transport Test (MOT) is made up from various regulations, including the Construction & Use Regulations 1986 (CUR 1986), and the Road Vehicle Lighting Regulations 1989 (RVLR 1989). The CUR mentions that any lights fitted to a vehicle must actually be in working order, and the RVLR stipulate the angle and colour. The RVLR, however, makes no mention of intensity of the light emitted from headlights, but Schedule 4, Part 1, Section 4 of RVLR 1989, states 'lights must not be set to dazzle on-coming drivers'. Does this mean that even if lights are correctly angled horizontally and vertically that they can not still be a hindrance due to the amount of lumens (the measurement of candle power) projected? Well, if it was not an argument once, then perhaps there is an argument now!

In this 'hi-tech' world, it would appear that the word innovation seems to be a replacement for the word 'invention' and it might appear that in the instance of headlight technology, innovation may now have run its course! Making lights brighter, by whatever means, may give

the car manufacturer an unique selling point, telling their clients that the driver of their vehicle will see further ahead, but at what cost to the on-coming vehicle? Is this 'supposed enhanced visibility' going to encourage the driver to extenuate their driving ability through their perceived extra safety aid? We have heard reports from friends and colleagues with recently purchased new vehicles, who were told by the salesman that the driver is likely to get flashed by on-coming drivers when driving at night because of the intensity of the headlights, but "not to worry, because the manufacturer was quite sure that the lights were within the Government guidelines." Are we now confusing legal and safe and responsible!

Vehicle design

How have we got into this situation of manufacturers trying to out-compete each other in such a serious topic as shining high intensity torches into another road user's eyes? Perhaps we have to look at the recent changes to vehicle design, prompted by EuroNCAP.

In order to reduce injury to pedestrians upon impact, some of the manufacturers have taken the responsible view of altering vehicle design. This has meant altering the height of certain impact zones to reduce the injury to an individual because the impact on the body is now in a place which has more resistance to the impact. Hence, better chance of survival. This has to be good! However, in order to accommodate these alterations, certain component parts, like headlights, have had to alter in position, and 'bumpers' as they used to be, have now become integral crumple zones. There are confines laid down in the RVLR 1989 which sets a parameter as to how high off of the floor and how far into the centre of the front of the vehicle the headlights should be placed. This, in itself, produces a scope of vision which the lights work within. The higher the lights within the degree of angle, the further the hypotenuse (the furthest point where the lights meet the ground – Pythagoras' Theorem), and hence the earlier the beam will strike the on-coming traffic. As the distance between the two vehicles decreases, the on-coming lights get higher and more intense, even if within the parameter set in RVLR. We must also consider the 'scroll switch' which adjusts the height of the lights according to the load being carried. Of course, the brighter the lights, the worse the scenario.

Time for change

Taking into consideration all of the above, light intensity, CUR, RVLR, manufacture's marketing ploys and EuroNCAP, perhaps now might be the time for the Government to re-visit the regulations regarding the lighting of vehicles at night. Technology and innovation has moved on a great deal since 1989. Volumes of traffic have increased also. An overhaul of the system is well overdue.

Whenever a death occurs on the road, the police have to undergo a rigorous 54-point check. This must be started at the scene of the incident in order to preserve evidence such as witness statements, length of skid marks to determine speed, weather conditions and any other extenuating circumstances, such as lighting conditions, vehicle roadworthiness, road engineering, driver experience and training, and vehicle ergonomics. They should also be able to ascertain if vehicle lights are incorrectly set. If you were the on-coming vehicle, and it was proven that the setting of your lights could have been a contributing factor, then you, as the driver – not the mechanic, and not the vehicle manufacturer – would almost certainly get prosecuted under RVLR 1989, an Act that is clearly out of date.

