

# All things bright and debatable

*European legislation on daytime running lights won't enhance road safety. In fact, quite the contrary, says Howard Redwood*

**From February 2011, new EU legislation dictates that all new vehicles built in Europe will be fitted with daytime running lights (DRLs). On the face of it, this seems like a very bright idea – if you'll excuse the obvious pun – until you start to dig a little deeper into the subject.**

While car manufacturers have gradually introduced daytime running lights as a safety feature, it appears that they might not actually fulfil that role. In fact, a number of EU countries have already reversed the legislation because their Killed or Seriously Injured (KSI) figures – a standard measure of road safety – jumped by between 6% and 12%. This was mainly due to an increase in pedestrian and cyclist deaths.

Surely, lighting up a vehicle will make it more conspicuous and therefore much better protection for the occupants (who are already protected by a safety cage, airbags, impact protection zones, and seat belts)? However, this is before considering that DRLs have to be set at a light output of 1200 candela (cd, or candle power), 50% brighter than a dipped headlight.

Newton's third law of motion states that for every action, there must be an equal and opposite reaction. This law normally refers to forces acting on a body, but it could equally be adapted for this scenario, where for every vehicle you can see, there must be something that you can't.

Dr Peter Heilig, professor of ophthalmology

at the University of Vienna, seems to think so: "The capacity of our cognitive processing has a natural limit, but in traffic situations which are rich in detail, although the first essential moments are captured in the gist of a scene, an activity, like too many lights, causes



overcrowding, distracting and irritating the thought and concentration processes." Austria has reversed the EU legislation because its KSI figure increased by 12% due to the introduction of DRL. The authorities there realised a phenomenon known as 'information overload', where the brain misses crucial information, producing incidents that fall under the category of 'Looked but Failed to See'. This is the same reason for most pedestrian, cycle and motorcycle injuries in the UK and the basis for the government's Think! campaign, designed to protect the vulnerable road user. It is probable that daytime running lights will only increase the visibility of any vehicle with stronger lights, shifting attention away from any casual traffic scene. The Compulsory Basic Training (CBT) for moped and motorcycle riders currently champions the use of dipped headlights during the day in order to protect their vulnerability. This action, until now, has been regarded as best practice because there is currently no daytime running light pollution. Despite the intention to allow this more vulnerable group of road users a safer passage, they are still involved in incidents where a driver of another vehicle fails to see them. What is going to happen when daytime running light legislation is added to the statute book, when all vehicles will eventually have lights so bright that the UK's roads will look like airport runways?

And what about the case for pedestrians and cyclists? Children are always encouraged to wear reflective materials, but as Professor Peter Heilig explains: "Reflecting materials appear



to be ineffective in connection with DRL. The illumination of bicycles suffers from systematic misconception: with decreasing daylight intensity, front and rear vehicle lights attract the attention of other traffic participants. However, cyclists are hard to observe and to detect against a darkening background. The average bicycle illumination does not protect at all against the risk of (fatal) side impacts."

So, is the government's new perception of road safety to put unnecessary lights on to vehicles so that we can shine them at the oncoming driver or the driver in front, distract them, making them miss the crucial anticipation links which would normally protect the more vulnerable? You would be forgiven for thinking so, because we have another problem: the growing problem of High Intensity Discharge (HID) lights, also known as Xenon. These are being fitted to vehicles in increasing numbers, but the worst culprits are the retro-fit upgrades.

Xenon lights are a newer generation of headlight that can be as much as three times brighter than the more traditional standard halogen fitting. The bulbs contain Xenon gas, which produces a more uniform intensity, allowing drivers to see the road more clearly. This is good if the lights are set correctly: the problems arise with the levelling mechanism and the fact that the light emitted is towards the ultra-violet end of the light spectrum.

Dr Edgar Leuenberger, Asian Eye Institute glaucoma and cataract specialist says: "The use of Xenon lights comes with a degree of responsibility. For someone with minimal cataract condition, the severe blinding glare caused by Xenon lights can cause temporary blurry vision that may lead to accidents."

Further studies, from 2003, by Mainster and Timberlake from the Department of Ophthalmology at the University of Kansas Medical Center, reveal that three types of 'eye disability' exists from glare:

■ Veiling disability occurs when a light source reduces the contrast of a visual target by superimposing light on the visual target's retinal image. An example would be to look at a person standing in front of a sun-filled window. The body resembles a dark silhouette despite the abundance of light.

■ Dazzle disability occurs when a bright light concentrates towards the viewer's central field of vision, changing the contrast between lighter and darker details of a visual target's foveal image. An example is when oncoming headlights fill more space than they should, making it difficult for the viewer to make distinction between darkness and light.

■ Scotomatic disability occurs when a brilliant light source decreases visual sensitivity, or "puts a retinal area out of business". An example is an extremely strong light quite often in the blue wavelength, like a flash from a camera causing rapid bleaching of the retinal eye receptors. It can take some time to recover from this.

Due to the nature of the intensity of Xenon lights and, to some extent, Light Emitting Diodes (LEDs), incorrect horizontal and vertical positioning can cause all three of the above disabilities to take place. The Xenon system relies on a floating system that responds to sensors on the vehicle's suspension. The problem with this is that the horizontal plane responds in a reactive measure – slightly after the wheels have left the dip in the road. This late response brings the lights up when the vehicle is on a higher plane causing one of the three dazzling effects. The Xenon system has no scroll switch for manual adjustment, and thus

“

**The severe blinding glare caused by Xenon lights can cause temporary blurry vision that may lead to accidents**

”

relies on the manufacturer's factory setting. The retro-fits are a problem, unless the consumer has technological software to read the vehicle on-board computer data, the lights will almost certainly be incorrectly set.

The current MOT regulations do not adequately cover the testing of Xenon lighting systems. Data produced by two manufacturers makes it abundantly clear that to set a Xenon system, the vehicle must be moving at 2.8mph. The current MOT system does not allow for this, therefore MOT agents have to allow the vehicle through on the factory setting. Our MOT system should be robust enough to be able to deal with any technological advances, but it clearly is not.

In September this year the UK government declared that it wished to bring certain laws back into the realms of 'common sense value', which has been the aim of Roy Milnes from Drivers against Daylight Running Lights (DaDRL) for over a decade. DaDRL and Blinded Bi-Xenon have now amalgamated to form Lightmare.Org in a common stance to lobby the UK government to get some aims and objectives back into the scope of road safety. This stance is echoed by the Driving Instructors Association and DIAMOND Advanced Motorists, which would also like to see the government rescind the EU legislation on the issue of daylight running lights and revise the legislation concerning construction and use, so that we can be sure that no vehicle on the road would be responsible for someone's death through faulty light settings.

As with all requests to the government to get anything changed, there has to be a movement of like-minded people behind it. Visit [www.lightmare.org](http://www.lightmare.org) to see all the other organisations that are behind the proposals.

Something has got to change. Shining very bright lights at each other is not road safety – quite the contrary. We want to do something about it. Now who is going to help us?

Acknowledgements:

Dr Edgar Leuenberger, Asian Eye Institute; Dr Peter Heilig, Professor of Ophthalmology, University of Vienna; MA Mainster & GT Timberlake, Dept of Ophthalmology, University of Kansas