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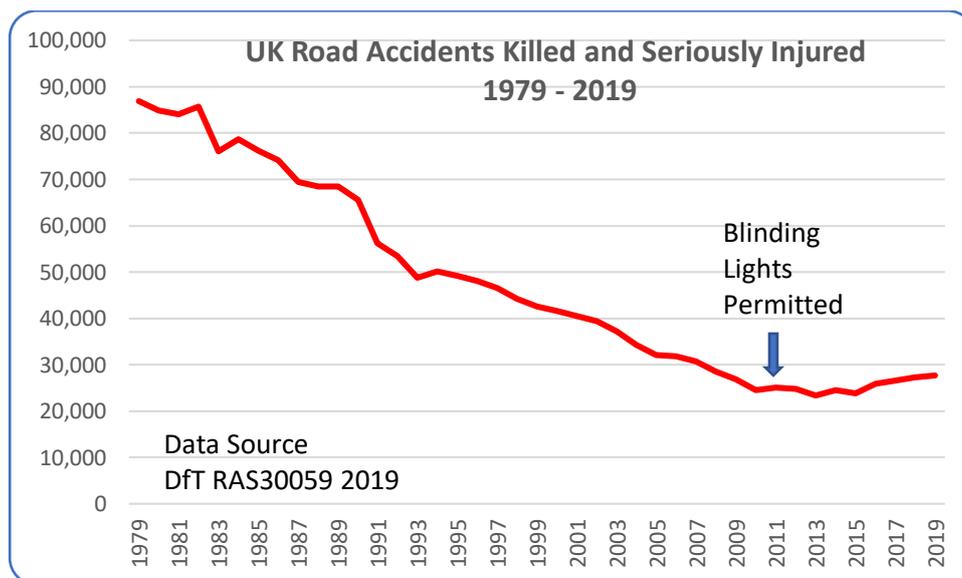
11 April 2022

To all PACTS members,

The "Lightmare"

Lightmare are worldwide a voluntary group of experienced motorists including scientists, engineers, mathematicians, lawyers and ophthalmologists supported by pedestrian, cycling and motorcycling organisations. We are committed to improving road safety by reducing glare and other distractions in the driving environment and have been campaigning since 1989 for sensible light limits.

We are concerned (as probably you all are) that instead of continuing to fall due to safer roads and vehicles, road accidents are increasing in the UK, the EU and the USA. Probably an extra 10,000 KSI UK accidents.



Road Safety Experts claimed Daytime Running Lights mandated in 2011, would save 15% of fatal and 10% of seriously injured crashes - there has been NO reduction, accidents have increased.

Mr. Davies has kindly responded to some of us, he is dismissive of the link between blinding lights and KSI however is unable to explain why there are an extra 10,000 KSI in the UK. He states:

*"The view from safety experts, and not just the car industry but those with an understanding of vision and safety statistics, is that although LED glare can be annoying **it is not leading to casualties** and that the better lighting, they provide has benefits in other ways."*

The life and death limit for the safe light level that a human eye can withstand should be determined by qualified professional ophthalmologists, not road safety experts.

Vienna University is the one of the foremost institutions in the world specialising in the functioning of the eye and its interaction with the mind. Emeritus Professor Peter Heilig and his colleagues have produced a report "Light SINN" based upon expert ophthalmological evidence about the tragic effect of blinding light on the human eye – "Light SINN" (attached) identifies the causes and proposes solutions.

A second factor are LED lights which are a flat source do not comply with the Road Vehicles Lighting Regulations 1989 which are based upon incandescent point source which emit spherically uniform light.

Dr. Nisa Khan, one of the foremost experts in the world on LED lights writes:-

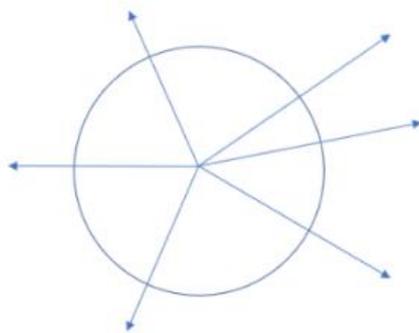
“Flat light sources produce Lambertian light distributions and only LED flat light sources do this. This means that luminous intensity and luminance are both non uniform in space for the source and what the viewer sees.

ALL of illumination scientific theories are based on point light sources, which means there is spherical uniformity for luminance and luminous intensity regarding the light source and what the viewer sees.”

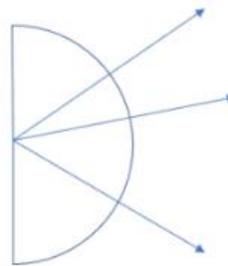
Dr. M. Nisa Khan, President IEM Lighting Technologies and Author, *Understanding LED Illumination*.

The art and science of illumination for the past 150 years have been predicated on the foundational premise that the light source can be reduced to a single infinitely small mathematical point.

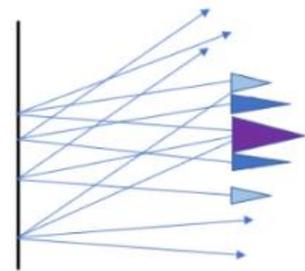
From a point source, the light emanates in all spherical directions uniformly, such that taking measurements at any point in space would result in the same readings. This is shown on the left side of the diagrams.



Spherical Emitter



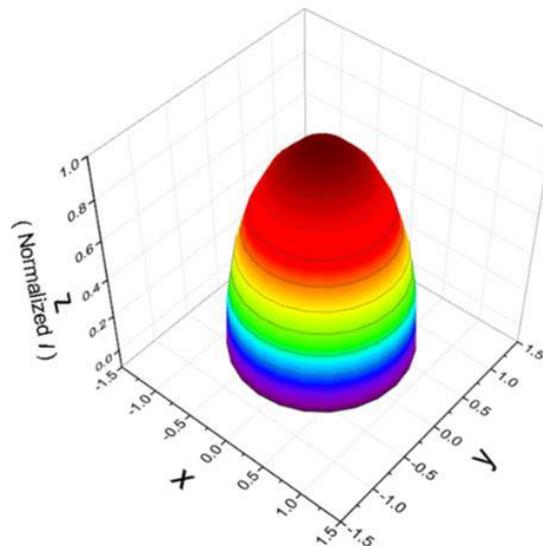
Theoretical Hemispherical Emitter



Flat Surface Emitter



Spherical Emitter



Flat Surface Emitter

Light Emitting Diodes, however, emit light from a flat surface, meaning that there is no curvature. The light leaves the chip surface within a given escape angle and because of the flat surface, the light rays intersect.

The largest amount of intersection occurs in the middle of the chip and the least amount occurs on the chip edges. The resulting shape of the light from an LED is a spatial energy profile resembling a bullet, as shown on the right side of the diagrams.

While human comfort level for the density of visible light is approximately 300 nits, LED chip makers have already exceeded 100,000,000 nits of peak luminance, resulting in high risk of short-term and long-term eye damage, with babies and children being particularly at risk.

In addition, due to the small 1mm x 1mm size of an LED chip, and due to the extreme density of the light, the entire energy emitted by the chip lands on the eye nearly invariant of distance.

The bullet-shaped non-uniform energy profile interferes with normal human nerve functioning, causing seizures, migraines, panic attacks, anxiety, and agitation.

There are no government regulations to protect people from dangerous LED light.

Thousands and thousands of drivers complain about dangerous blinding lights, I personally know of several friends who have had to stop driving at night.

The current petition [Petition - Ban Blinding Headlights and Save Lives! - Change.org](#) has over 30,000 signatures.

I attach a 5,200 vote petition we ran in 2010/11 – just skim read the comments – many are doctors. Also attached is a petition to No 10 created by my late associate Ken Perham the London taxi driver in 2010.

Lightmare ask PACTS

Will PACTS ensure that blinding vehicle LED lights comply with current regulations?

Will PACTS seek confirmatory professional ophthalmological advice to determine the safe light level that the human eye can tolerate and state this in the regulations?

In the interests of road safety, we look forward to your response.

Yours sincerely,



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References

www.softlights.org

[Resources – Soft Lights Foundation](#)

www.lightmare.org

[The Experts \(lightmare.org\)](#)

[Campaign launched over 'dazzling' HID car headlamps - BBC News](#)

[Petition - Ban Blinding Headlights and Save Lives! - Change.org](#)

<https://medicalxpress.com/news/2019-05-eyes-health-authority.html> states:

The "blue light" in LED lighting can damage the eye's retina and disturb natural sleep rhythms. "Exposure to an intense and powerful [LED] light is 'photo-toxic' and can lead to irreversible loss of retinal cells and diminished sharpness of vision" Chronic exposure can "accelerate the ageing of retinal tissue, contributing to a decline in [visual acuity](#) and certain [degenerative diseases](#) such as [age-related macular degeneration](#)."

This letter is published on the Lightmare website www.lightmare.org