

## ***From Old Timers to Bright Futures***

### **P Heilig and R Milnes**

The warm, friendly yellow light of their headlights enhances the charm of beloved vintage cars. The carbide, acetylene, and oil lamps weren't much brighter than their candle lamp predecessors.

Electricity was first used in 1898 (Columbia Electric Car); only the high beam was used at that time. In 1915, the first dipped headlights were developed (Guide Lamp Company).

Soon after, fog and cornering lights emerged, followed by directional headlights or adaptive headlights in 1947, and headlights with an asymmetric illumination geometry in 1957.

For many years, the 7-inch diameter size was stubbornly prescribed *ex officio*, thereby delaying various valuable innovations.

The next step in history was the development of halogen systems.

All of these light sources shared a balanced spectrum, similar to the color distribution of an incandescent bulb – an overall yellowish appearance with low glare.

The significantly brighter, bluish-white xenon headlights, HID (High Intensity Discharge), were the first to attract complaints about their glare. In foggy conditions, the following comment was made: "Halogen headlights were more efficient in fog."

Eventually, the triumph of LED (OLED) headlights was unstoppable. Glare for all road users, both motorized and non-motorized, pedestrians, and cyclists, became a serious problem.

Supposed "Glare-free" systems were developed (Matrix, IntelliLux, various laser innovations, etc.) however to sense oncoming vehicles, drivers drivers are momentarily blinded and unless the road is billiard table smooth, again they blind drivers. Whilst permitted in the EU, these systems are not approved in the USA.

Laser diodes emit a much more intense, bluish-dominant light (~450 nm). With suitable filters, a "daylight-like spectrum" can be created with this variant of laser diodes. Dynamic "area light modulation" can be implemented using a "mirror matrix," etc. "Video messages" - such as a "STOP!" Projected onto the road as a warning for pedestrians, a so-called 'construction site light' can change the light distribution in narrow spaces, and navigation arrows or more complex animations can now be easily 'played' onto the road.

Laser taillights, which paint a large warning triangle into the water particles of the fog, are becoming the next gimmick. Light (laser) signals inside the vehicle can also interact with the occupants and communicate with the driver, warning them of hazards or transmitting messages during 'piloted' driving.

As "information about possible braking deceleration, situation-appropriate braking pressure can be generated, reducing the risk of rear-end collisions." 'Adaptive High Beam Assist' pairs cameras with "intelligent image analysis" (sic) and "Intelligent Light Systems" are proving useful - it all sounds promising.

Selective Yellow car headlights were introduced between 1939 and 1945 "to make it easier to distinguish the military columns of the French Army, the Resistance, and the Allies."

Until January 1993, a fine for a vehicle registered in France was issued with a white headlight.

In 1993, Selective yellow was abandoned in favor of white light due to "European harmonization" (a euphoric or even euphemistic phrase).

Curiously: "Every classic car owner curses the old, dim headlights" - that's not true - classic cars don't deserve it! Classic car lights are easy on the eyes, vision, and cognition.

'Evil Eye' (tuning): Hood extension, partially obscures the headlights "Low beam headlights are often covered with film in left-hand-driving countries to avoid glare." Tatra built cars with three headlights. High beam headlights: High beam and fog lights alternate (prohibited).

"In some countries, 'spare bulbs' are required." Incandescent bulbs are simple to replace but sealed in LED's which require a technician to install???

<https://www.bmimi.gv.at/verkehr/ohnemotor/recht/fahrradverordnung.pdf> ="Page not found" - this explains it!

Almost all modern bicycle headlights cause glare, including the bulbs on Pedelecs, e-bikes, e-scooters, e-rollers, e-scooters, airwheels, mono-e-wheels, e-hoverboards, hovercarts, e-funquads, e-drift trikes, e-go-carts, etc. Minor eye irregularities (cornea, lens, vitreous body, early stages of retinal degenerations, - marginal light damage etc.) and certain multifocal optical correction systems, which are not disturbing in moderate lighting, can become a serious problem due to undesired glare-effects. The consequence is that all traffic participants could be potentially "blinded" by dazzling bright blue glare to the point of "Disability".



**Daytime Running Lights:** *Daytime running lights (DRL) "High fines for those who don't use lights"* <https://www.adac.de/verkehr/recht/verkehrsvorschriften-ausland/lichtpflicht-tag/>

**Daytime Running Lights (DRL) violate:**

- The Convention Concerning The Power of Authority
- The Law in Respect of the Protection of Infants (1969)
- The bond of Protection
- The Principle of Equality
- Declaration of Human Rights (1948) Article Three
- The Laws of Logic
- Public Ethics and Morals

"An EU daytime running light directive would be difficult to reconcile with the Declaration of the Rights of the Child of November 20, 1959, which provides that children enjoy special protection.

Article 2, paragraph 1 of the International Covenant on Civil and Political Rights of December 19, 1966, also grants every child the right to those protective measures from society and the state that their legal status as a minor requires.

A danger, particularly to children, from mandatory, state-mandated driving with daytime running lights could contradict these protective duties and rights.

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Eye strain (pars pro toto): isotropic light sources (radiating in all directions), excessive light intensities, excessively high-energy light, excessive suprathreshold stimulation – even in peripheral retinal areas, flickering light.

Vintage cars - exonerated, newer products less so. Glare and irritation: increasing, distractions ditto; as a result, there is a risk of distraction blindness with fatal consequences.

Evidence Based Medicine: Light damage to the retina paves the way for macular degeneration: Therefore, all light stress (high intensities, whitish-blue light) should be avoided\* (e.g., in the case of genetic load) – and the number of avoidable stimuli (DRL, etc.) should be consistently reduced.

Evidence-Based Medicine; not Estimating Believing and Meaning (ChatGPT, etc.).  
Distraction Blindness: overflow of visual short-term memories and working memories. A traffic-relevant object would be seen clearly but – worst case – not perceived.