



The Society of
Light and Lighting

Opinion: Evidence for design guidance

CIE technical report 115:2010 offers guidance for road lighting design, including recommended lighting conditions for different situations. It is recognised that this guidance is in need of updating. When setting new recommendations it would be also useful to state the basis of recommendations – the sources of information which led to specific values being chosen. For the designer, this allows them to consider the quality of those data – are they relevant, credible and robust? For the researcher, knowledge of the data underlying recommendations allows those data to be challenged.

Many questions can be asked of current recommendations. For class M3, the target average road surface luminance is 1.0 cd m^{-2} . For what reason(s) was that value chosen? Why does it increase to 1.5 cd m^{-2} (class M2) if traffic speed increases from ‘moderate’ to ‘high’, or if traffic volume increases from ‘moderate’ to ‘very high’? Or in other words, how do we know that a 50% increase in luminance mitigates the higher crash risk associated with increased traffic speed and volume? (And what are moderate and high levels of speed and volume?). Why does overall uniformity change from 0.35 in classes M5 and M6 to 0.4 in classes M1 to M4? A specific class of lighting is established by the accumulation of points for different factors, replacing the narrative descriptions used previously in CIE-115:1995, and giving the illusion of an objective choice: is that a credible process? Finally, are six lighting classes really needed?

The research reported in this issue of Lighting Research and Technology contributes to ongoing knowledge of lighting for transport. There is

work about road surface reflectance, the accurate characterisation of which is an essential component of luminance-based design. There is work on vehicle lighting. While road lighting design tends to ignore vehicle lighting, advances in technology mean they could work in better harmony, with potential benefits for road users and for wider society. There is discussion of the impact of light pollution on the environment which contributes to our understanding of the costs and benefits of road lighting provision.

Research such as this tends to provide incremental advances in knowledge. It is then the task of the technical committee responsible for updating guidance to integrate knowledge from across the large body of road lighting research. It would be beneficial if subsequent versions of CIE-115 and other design recommendations clearly reported the evidence basis of their recommendations, the specific items from that body of research that were assumed to be authoritative. That is feasible for scientific evidence, through the citation, for example, of journal articles. While it is more difficult to cite experiential evidence, which does not tend to be archived or accessible to others, that extra difficulty should not mean it is not done.

Answers to the questions posed above should ideally be found in evidence sources cited in CIE-115:2010, but any link between guidance and recommendations is not clear. Without action to ensure the evidence basis is clear in future guidance, that same list of questions will remain.

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