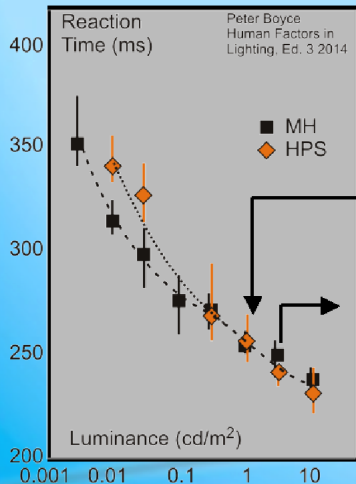


Visual Impact of Spectra

Glare

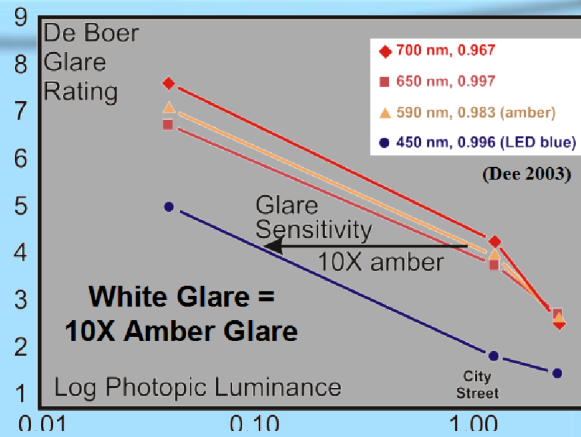
Eye is 10X more sensitive to blue spectral components in white light than amber



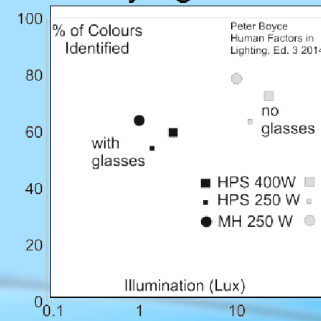
White = Amber

Urban Roads
Road Distractions = 1→2 seconds

14/23



White or Amber? < eye glasses



This slide compares three aspects of white and amber LED lighting. The top-right graph is from Dr. Derloske and Bullough (Rensselaer Inst.) at NHTSA Workshop. The luminance of the light with blue spectral components has to be 1/10 the luminance of amber light if it is to have the same glare impact. This demands better shielding, or reduced light output (1/10 wattage).

The lower-left shows that the improvement in reaction time with white light amounts to approximately 10% for low luminance and provides no benefit at intermediate and higher luminance. However roadside distractions add an additional 1-2 seconds reaction time. Therefore the effect of light colour has little real effect on motorist reaction time.

The lower-right graph addresses the use of broadband white light for colour identification. This study did not use LED lighting. It reveals that wearing the correct prescription eyeglasses had a more beneficial effect than using broadband (white) metal halide (MH) lamps over “relatively” broadband HPS.

Therefore except for the aesthetic appearance of white after dark, there is no safety or real vision benefit to white over amber lighting. However there is a significant health and ecological impact of white light. And, white light bleaches our sensitive night vision and prevents us from seeing into lower-illuminated areas.

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