

Workshop on Headlamp Illumination: Balancing Glare and Visibility

Background: Advances in forward lighting technology are being developed that may give drivers more illumination to guide them and help them see objects ahead. But the cost of more illumination may be greater glare to other drivers that can be bothersome as well as detrimental to visibility. Existing regulations have been developed to balance the visibility benefits with the glare consequences. However, the advances in more efficient light sources and adaptive lighting may be changing this balance. Designers and regulators face a challenge in evaluating drivers' visibility needs and needed glare limits because appropriate safety metrics are lacking. Accident risk is the ultimate safety metric but may be difficult to correlate to headlamp design and regulatory decisions. Defining appropriate metrics and safety-related criteria needs to be the initial step in developing a common basis for evaluating tradeoffs between visibility and glare.

Workshop objectives: The goal of the workshop is to bring together a wide cross section of illumination, vision, and human performance experts to present information on metrics and methods for evaluating the safety consequences of forward lighting.

Program:

Morning: Invited Speakers discussing

- Nighttime driving tasks and visual information requirements
- Relating the influence of vehicle lighting to crash risk through crash investigations and analyses of crash data bases. Crash investigation limitations in assessing influence of vehicle lighting on accidents
- How to quantify the effects headlamp illumination and glare on driver vision, behavior, and crash risk
- Individual visual performance differences, including older drivers
- Eye physiology and glare effects
- How to assess crash risk of daytime glare from daytime running lights
- Headlamp variables that can be modified to influence the tradeoff between visibility and glare
- Future forward lighting technologies and implications for meeting driver visual needs
- How to balance detrimental glare effects and visibility benefits. How to determine boundaries of acceptable and safe forward lighting illumination.

Afternoon: Discussions about best metrics and methods, recommendations for new research, recommendations for determining boundaries (either in break out groups or all together)

Possible Attendees:

UMTRI, RPI Lighting Research Center, U of Iowa, Ophthalmology/optometry researchers, Older (possibly also disabled) driver safety and mobility experts, Replaceable Light Source Manufacturers, Headlighting manufacturers, Motor vehicle manufacturers, AAA, IIHS, Consumers Union, Crash Investigators, Transport Canada, ECE representative, SAE representative (forward lighting committee member)