



Backgrounder

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GLARE FACT SHEET

The Motor Vehicle Lighting Council (MVLIC) – a coalition of the leading global automotive lighting and component manufacturers and related education and research institutions – is working together with industry groups such as the National Highway Traffic Safety Administration (NHTSA) and the Society of Automotive Engineers (SAE), to improve lighting and visibility for all drivers by reducing roadway glare.

While initial studies on glare have been conducted by various organizations and research institutes, MVLIC supports the continued efforts to further understand and address this important safety issue.

Facts about glare:

- Glare is a condition of discomfort in the eye and reduction in visibility produced when a bright light enters the field of vision, especially when the eye is adapted to the dark. Glare can be caused by dozens of different factors.
- There are two effects of glare: discomfort and visual disability. Discomfort glare causes an annoying or painful sensation. Disability glare actually reduces the eye's ability to distinguish small changes in brightness in the field of view and can reduce visual perception of distance.
- According to a study funded by the American Automobile Association (AAA) Foundation for Traffic Safety, individuals who are at greater risk for nighttime glare are those who drive mostly on high-volume, two-lane roads and seniors.

Glare related to driving:

- There are many different sources of glare on the roadways: unshielded street lights, overly bright advertising signs, misaimed headlamps, high-mounted headlamps, illegal high-wattage bulbs, improper use of high beams and auxiliary forward lighting, weather conditions and non-compliant Xenon headlights are believed to be significant contributors to this issue.

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- Glare can affect both day and night driving performance. During the day, sunlight produces direct glare and causes indirect glare from surface reflections. At night, oncoming headlights produce direct glare by shining into the eyes of drivers, while indirect glare is experienced in rearview mirrors that reflect light from trailing vehicles.
- Although difficult to define and measure, driving fatigue may occur as a result of lighting conditions, and glare from approaching headlights may influence its occurrence.
- Because they are relatively rare and easy to identify by their unique bluish-white color, Xenon headlights tend to be associated with increased glare. However, legal Xenon lights that are properly installed and aimed meet NHTSA's safety codes for automotive exterior lighting and do not cause excessive glare.

Glare Research:

The Lighting Research Center at Rensselaer Polytechnic Institute:

- Several factors impact glare under nighttime driving conditions, such as the ambient light level, the amount of light reaching a driver's eyes from oncoming headlamps or reflected from mirrors, and the color of the headlamps.
- Discomfort glare, measured using a scale ranging from just noticeable to unbearable, is affected primarily by the amount of light reaching the eye, the ambient light level and the headlight color. "Bluer" lights produce slightly more discomfort than "whiter" lights of the same intensity.
- Disability glare, measured by the ability of drivers to detect and respond to targets along the roadway, is affected primarily by the amount of light reaching the eye in relation to the ambient light level. Headlight color has little impact on visibility even though it can affect comfort.
- Xenon headlamps tend to produce more peripheral light, which improves peripheral visibility in comparison to halogen headlamps. This increased peripheral light might make proper aim more important for Xenon headlamp systems.

NHTSA:

- The percentage of drivers who do find glare disturbing was highest in the 35 to 54 age groups, with females being more glare-disturbed.

- Drivers who do find glare to be a problem are not necessarily older drivers. In fact, the ratings of discomfort from glare for older drivers were not significantly different from that of younger drivers.
- Older drivers reported being the most disturbed by oncoming (direct) glare, while younger drivers are bothered more by following (indirect) glare.
- NHTSA knows of no injuries or deaths caused by glare attributed to Xenon headlamps.

The University of Michigan Transportation Research Institute (UMTRI):

- Current Xenon low-beams tend to direct less light towards oncoming drivers than do tungsten-halogen low-beams.
- Studies of Xenon headlamps found that they do not cause disabling glare to oncoming drivers.

MVLC's Position on Glare

- The MVLC has encouraged NHTSA to investigate many potential solutions to reduce the perception of glare coming from Xenon headlamps, including automatic leveling systems which would maintain headlight beams at an optimum angle.
- Headlight glare can be reduced by proper headlight aim, regular inspection and adjustment, control of non-compliant lighting systems and control of the headlamp height.
- The MVLC strongly supports independent industry research initiatives such as UMTRI, the Lighting Research Center (LRC) at Rensselaer Polytechnic Institute and the Transportation Lighting Alliance (TLA).

For additional information on glare, visit www.mvlc.info.

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