

Evaluation of Advanced Vehicle Lighting Functions

Through its Transportation Lighting and Safety program, the Lighting Research Center (LRC) is evaluating the potential for new lighting technologies and approaches to improve driving safety at night, including new car headlight systems. For the study, vehicle manufacturer Audi AG provided the LRC with an Audi A7 equipped with adaptive high beam “matrix lights” that allow drivers to benefit from using high beams all the time while selectively dimming a portion of the beam in the direction of other drivers to prevent glare. In the Audi system, the beam pattern is split into numerous individual light-emitting diodes (LEDs) arranged in a grid or “matrix” that adapts to the surroundings in real-time.



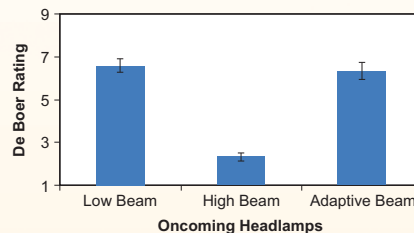
The Audi A7.

In the present study the LRC is evaluating the safety impacts of these new adaptive high-beam systems, which are beginning to appear on international vehicle models.



Artist's rendering. Note how the bright headlamp beam avoids the oncoming car. (Image courtesy of Audi AG.)

The LRC earlier studied adaptive high beams as part of a project for the National Highway Traffic Safety Administration (NHTSA) that resulted in a report to Congress on nighttime glare and driving performance. The LRC's research for NHTSA demonstrated that forward visibility under adaptive high-beam systems was comparable to that under high beams, while disability and discomfort glare for oncoming drivers were comparable to levels experienced when facing low beams.



The adaptive driving beam system produced less discomfort glare (higher numerical De Boer ratings) than high beams, and similar to low beams.

Although these systems have been widely used in many countries, few tests have been conducted in the U.S. Through these evaluations, the LRC hopes to provide objective evidence that might be useful in assessing whether and how adaptive high beam systems might provide safety benefits compared to conventional vehicle headlights, and how to consistently measure and specify their performance.



Learn More

Watch a brief video about the LRC's study:

www.youtube.com/watch?v=pRMomZcs4y0



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