U.S. Department
of Transportation
**National Highway
Traffic Safety
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DOT HS 809 973

December 2005

Assessment of Headlamp Glare and Potential Countermeasures

Survey of Advanced Front Lighting System (AFS) Research and Technology

Technical Report Documentation Page

1. Report No.	2. Government Accession No.	3. Recipient's Catalog No.
DOT HS 809 973		

4. Title and Subtitle	5. Report Date
Assessment of Headlamp Glare and Potential Countermeasures: Survey of Advanced Front Lighting System (AFS)	December 2005
	6. Performing Organization Code

7. Author(s)	8. Performing Organization Report No.
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9. Performing Organization Name and Address	10. Work Unit No. (TRAIS)
Lighting Research Center, Rensselaer Polytechnic Institute 21 Union St Troy, NY 12180	11. Contract or Grant No. DTNH22-99-D-07005

12. Sponsoring Agency Name and Address	13. Type of Report and Period Covered
National Highway Traffic Safety Administration NHTSA, NRD-13 400 7th St SW Washington, DC 20590	Task 7 Final Report
	14. Sponsoring Agency Code

15. Supplementary Notes
Michael Perel was the NHTSA COTR for this project.

16. Abstract
The goal of advanced front lighting systems (AFS) is to actively control headlamp beam patterns to meet the dynamic requirements of changing roadway geometries and visibility conditions. AFS is being rapidly introduced worldwide due to its attractive styling aspects and potential safety benefits. However, before AFS becomes more aggressively implemented, it is necessary to better understand the impacts of AFS on drivers, other vehicles, and pedestrians. To achieve this understanding, this survey investigated comments on AFS from the NHTSA database (Docket 13957), reviewed relevant literature, and held a phone conference with automobile and headlamp manufacturers for industry feedback. The detailed results of the survey are described in this report.
This survey led to a general conclusion that, although a significant number of studies on AFS have been done, due to inconsistency in metrics used and lack of information on experimental procedure and scenarios, further research is still needed to quantify the effectiveness of AFS. In order to evaluate AFS technology, it is important to first identify the appropriate visibility, glare, and safety metrics and test methods. Second, based on these common metrics and test methods, examine the effectiveness of AFS compared to other vehicle forward lighting systems. Based on these findings, two tasks are proposed as future NHTSA research: (1) identify appropriate metrics, performance measures, and test scenarios for AFS; and (2) develop an AFS prototype for evaluation.

17. Key Words	18. Distribution Statement
headlamp, headlight, disability glare, discomfort glare, visibility, AFS, bending beam, town beam, motorway beam, adverse weather beam	

19. Security Classif. (of this report)	20. Security Classif. (of this page)	21. No. of Pages	22. Price
Unclassified	Unclassified		

Form DOT F 1700.7 (8-72) Reproduction of completed page authorized

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