**Title and Subtitle**
Survey of HID Headlamps in Use in the U.S. by Region and Time of Night

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**Abstract**
Headlamps with high-intensity discharge (HID) sources have been available on vehicles sold in the U.S. for a little over ten years. Although estimates of the proportion of HID headlamps in the vehicle fleet can be made based on sales data, there are uncertainties in those estimates because of lack of comprehensive compilation of data, unknown retention rates in the fleet, and complex regional differences in sales. Furthermore, number of vehicles sold and/or registered is not necessarily predictive of vehicles in use because of possible differences in overall driving rates or, most importantly, in nighttime driving rates.

This study was therefore designed to obtain direct measurements of the proportion of vehicles with HID headlamps in nighttime traffic. Eight sites (two in each of four metropolitan areas) were selected, and traffic at those sites was video recorded between the hours of 7:00 p.m. and 10:00 p.m. The observations were made in late February and early March 2008, when those evening hours were dark and virtually all vehicles had their headlamps on. Video recording was done with diffraction gratings mounted on the cameras so that the type of headlamps—HID or tungsten-halogen (TH)—could be easily discriminated by the spectrally dispersed headlamp images. Investigators later scored the videos, counting the numbers of vehicles (except for motorcycles) in terms of headlamp type (HID or TH), and number of headlamps on (both, one, or none).

The proportions of vehicles with HID headlamps varied by more than an order of magnitude, from 0.0151 to 0.200, across the eight sites. The proportion of HID headlamps did not vary over time within the three-hour observation periods. The proportions of TH-equipped vehicles with one headlamp not functioning varied from 0.0018 to 0.0129 across the eight sites.