

# Efficacy of “Wipers On, Headlamps On” Legislation



Many states require vehicle headlamps to be on whenever windshield wipers are used, but whether these laws actually offer intended safety benefits has been an issue of concern among the driving public in North America. A recent LRC study compared crash data in several of these states before and after “wipers on, headlamps on” laws were enacted. Multiple-vehicle crashes were segregated by the time of day (daytime, dawn/dusk, and nighttime) and by weather condition (clear or rainy weather; excluding weather conditions such as fog, snow, etc.).



## Sponsors

Transportation Lighting Alliance (TLA) Members:  
Automotive Lighting, Hella, OSRAM Sylvania,  
Philips Lighting, Visteon



View LRC Project Sheets at  
[www.lrc.rpi.edu/resources/newsroom/projectsheets.asp](http://www.lrc.rpi.edu/resources/newsroom/projectsheets.asp)

## Results

Wipers-on legislation was associated with a reduction in fatal rainy-weather multiple-vehicle crashes during the daytime, and an even larger reduction during dawn and dusk periods. No statistically significant changes in the proportion of fatal rainy-weather crashes were found during the nighttime. These data were analyzed in parallel with a psychophysical model that predicted a normalized rating of conspicuity of passenger cars with low-beam headlamps switched on, relative to cars without lights switched on. The increases in conspicuity for daytime and dawn/dusk periods were consistent in magnitude to the statistical crash data, illustrating that parallel analysis using independent, converging operations is important when assessing safety impacts of transportation lighting.

| State        | Period             | Daytime           |       | Dawn/Dusk        |       | Nighttime |       |
|--------------|--------------------|-------------------|-------|------------------|-------|-----------|-------|
|              |                    | Clear             | Rainy | Clear            | Rainy | Clear     | Rainy |
| California   | Before (2001-2005) | <sup>a</sup> 4009 | 190   | <sup>b</sup> 282 | 25    | 2621      | 166   |
|              | After (2006-2009)  | 2792              | 83    | 210              | 5     | 1958      | 102   |
| Kansas       | Before (2002-2006) | 567               | 39    | 39               | 7     | 225       | 16    |
|              | After (2007-2009)  | 248               | 21    | 14               | 3     | 112       | 13    |
| Maine        | Before (1994-1997) | 167               | 17    | 6                | 3     | 39        | 6     |
|              | After (1998-2002)  | 241               | 20    | 18               | 2     | 37        | 5     |
| Maryland     | Before (1994-1997) | 561               | 68    | 35               | 6     | 307       | 31    |
|              | After (1998-2002)  | 723               | 85    | 26               | 5     | 414       | 54    |
| Missouri     | Before (2000-2004) | 1251              | 146   | 0                | 0     | 569       | 75    |
|              | After (2005-2009)  | 1092              | 123   | 5                | 0     | 513       | 58    |
| Pennsylvania | Before (2002-2006) | 1623              | 191   | 100              | 10    | 782       | 108   |
|              | After (2007-2009)  | 892               | 106   | 59               | 8     | 410       | 48    |
| Virginia     | Before (1994-1997) | <sup>c</sup> 759  | 60    | 44               | 3     | 389       | 31    |
|              | After (1998-2002)  | 1054              | 35    | 52               | 3     | 440       | 29    |
| Pooled Data  | Before             | <sup>d</sup> 8937 | 711   | <sup>e</sup> 506 | 54    | 4932      | 433   |
|              | After              | 7042              | 473   | 384              | 26    | 3884      | 309   |

<sup>a</sup>p = 0.0002; <sup>b</sup>p = 0.003; <sup>c</sup>p = 0.00004; <sup>d</sup>p = 0.003; <sup>e</sup>p = 0.04

Fatal crash data from the U.S. National Highway Traffic Safety Administration (NHTSA) Fatality Analysis Reporting System (FARS). Multiple-vehicle fatal crash data in several states for different times of day and different weather conditions before and after wipers-on, headlamps-on legislation was enacted. Blue-shaded cells indicate statistically significant ( $p < 0.05$ ) one-tailed interactions.