

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.).



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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)	^a 4009	190	^b 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)	^c 759	60	44	3	389	31
	After (1998-2002)	1054	35	52	3	440	29
Pooled Data	Before	^d 8937	711	^e 506	54	4932	433
	After	7042	473	384	26	3884	309

^ap = 0.0002; ^bp = 0.003; ^cp = 0.00004; ^dp = 0.003; ^ep = 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.

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