# Heavy Trucks, Conspicuity Treatment, and the Decline of Collision Risk in Darkness

**Abstract**

In December 1992, Federal Motor Vehicle Safety Standard (FMVSS) 108, was amended to require conspicuity treatments on all heavy trailers manufactured after December 1, 1993. The standard was later modified and extended to tractors and older trailers such that by June 1, 2009 the entire fleet of tractors and semitrailers on United States roadways would reach full compliance with the regulation. To investigate the effect of the regulation, an analysis was conducted of the change in the odds that a fatal crash occurred in darkness, comparing scenarios in which the conspicuity treatment was likely to be influential to those in which the conspicuity treatment was likely to be irrelevant. From 1987 to 2009, the odds that a fatal collision involving a heavy truck occurred in darkness declined by 58% among the relevant crash scenarios, while little evidence of decline was found among the irrelevant scenarios. Disaggregations of crash scenario types suggest that the largest declines occurred in fatal rear end and angle collisions. A comparative analysis of light vehicles also found declines, although they were smaller and less sensitive to crash type. Similar but weaker trends were observed for nonfatal rear end collisions. The results are consistent with causal mechanisms that suggest that detection failure may be a significant contributor to the risk of striking a tractor-semitrailer in darkness, and that conspicuity treatments have significantly reduced this risk.

### Key Words

Conspicuity marking, FMVSS 108, heavy vehicles, rear end collisions, tractor-semitrailer