

Independent Studies Proving the Safety Benefits of Conspicuity

1983 Vector Study



- Study conducted, over two years, ending in 1983
- 2,000 Trucks, ½ Marked and ½ Non-Marked
- The reflectorized group showed an overall accident reduction of 18%
- Results led to the US DOT-C2 Regulations

(request the full report from the [Conspicuity Global Portfolio Manager](#))

2000 Darmstadt University of Technology Report



- 2216 accidents studied for analysis
- 37% of all truck side and 41% of truck rear collisions during darkness and twilight were caused by the truck not having been recognized in time.
- 1000 trucks taken for a study where conspicuity sheeting was applied.
- Over a two year period, the control group had 30 different side or rear collisions during the night. Only one accident occurred in the test group of trucks with contour markings.

(request the full report from the [Conspicuity Global Portfolio Manager](#))

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2001 NHTSA Report



- Study conducted between 1997-1999
- Conspicuity markings reduced side & rear impacts with truck trailers by 29% and fatalities or injuries by 44% in dark conditions
- Click [here](#) to download the full report.

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2001 US DOT FRA Study



Recognition of Rail Car Retroreflective Patterns for Federal Railroad Improving Nighttime Conspicuity

- Participants discriminated between freight cars and truck trailers for all four patterns evaluated.
- Vertically oriented patterns were recommended over outline and horizontally oriented patterns because they were less likely to be confused with the horizontally oriented truck patterns.
- Unreflectorized rail cars were more difficult to discriminate from trucks as illumination level declines.
- Click [here](#) to download the full report.

2003 Dutch Transport Safety Board Report

Recommendation: The Minister for Traffic, Public Works and Water Management is recommended to add as much impetus as possible to the introduction of European legislation on obligatory retroreflective contour marking for lorries. In addition, the advance national obligation concerning RRCM - in anticipation of the European Union legislation - should be included in national legislation as soon as possible.

Click [here](#) to download the full report.

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2004 TÜV Rheinland Group Report



Studies have shown that contour-marking of HGV provides the highest degree of conspicuity and significantly reduces the reaction time of car-drivers.

Recommendations:

- For an optimal marking of HGV, it is recommended to equip the side and rear with a contour-marking. At least 80% of each side should be marked.
- It is recommended, also under the aspects of soiling and aging, to use retroreflective material of type 3 for the contour-marking.
- It is recommended to use “white” or “yellow” retro-reflective material for the marking of lorries and their trailers.
- It is recommended to equip all new vehicles with more than 3,5 tons with contour markings. For the existing vehicle fleet, a transition period for retrofitting of at least six years is recommended.
- Click [here](#) to download the full report.

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2003-2005 NIIAT Study



- Conducted by Scientific Institute of Motor Transport (NIIAT) by initiative of Ministry of Transport
- Goal: prove effectiveness and economic effect of contour marking applied on heavy duty trucks and trailers and buses and its influence on accident rate decrease
- Participants: 94 fleet owners, 30,000 vehicles, 63 regions
- 67% reduction in accidents
- 62% reduction in fatalities
- 78% reduction in injuries
- showed high efficiency of contour marking application due to substantial decrease of social and economic damages of accidents

[\(request the full report from the Conspicuity Global Portfolio Manager\)](#)

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2009 Emergency Vehicle Visibility and Conspicuity Study



FEMA

- Advancing the state-of-the-art in emergency vehicle visibility/conspicuity will likely result from a combination of both active and passive conspicuity treatments—including enhanced emergency vehicle warning lighting systems and the increased use of retroreflective materials—to improve the visibility and recognizability (when desired) of emergency vehicles including ambulances, patrol cars, and fire apparatus.
- Click [here](#) to download the full report.

Hungary Institute of Vehicle Safety Study

- 1400 car/truck accidents studied
- Conclusions:
 - retroreflective markings on trucks would help to prevent 600 accidents/year, saving up to 65 lives
 - retroreflective markings on trucks can **reduce the chance of night accidents by 43%**, preventing 1000 injuries and **saving 65 lives on an annual basis.**

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2011 UMTRI Report



- analyzed collisions occurring 1987 to 2009
- clear linkage between the visibility of heavy trucks and crash risk
- night occurrences of relevant fatal collisions experienced a decreasing trend over the 20 years in which conspicuity laws were becoming mandatory on increasingly more trucks and semitrailers of differing sizes and ages throughout the US
- as more trucks and semitrailers apply conspicuity, the likelihood of relevant rear end and angle collisions occurring at night greatly decreases

[\(request the full report from the Conspicuity Global Portfolio Manager\)](#)

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2013 NTSB Report



- 9,084 fatalities in single unit truck crashes (37% of all fatalities involving truck crashes)
- Annual average of 2,309 crashes in which passenger vehicles collided with rear of single unit trucks and 4,124 with the sides
- Nighttime crashes involving side or rear impacts to single unit trucks were twice as likely as daytime crashes to result in serious injury or hospitalization
- ***Conspicuity improvements to single unit trucks would be beneficial in low light conditions***
- Retro reflective tape is inexpensive and simple to apply
- The data NHTSA used in developing the current class 8 regulation included classification errors, undercounting single unit truck fatalities by 20%
- **NTSB recommends that NHTSA require conspicuity markings on newly manufactured single unit trucks and determine the most efficient method to require retrofitting existing single unit trucks**
- Click [here](#) to download the summary document
- Click [here](#) to download the full report.

2015 NHTSA Report



- An estimated 1,524 car occupants and 1,136 light trucks and vans (LTVs) occupants (for a total of 2,660 persons) were saved from 1960 through 2012 by conspicuity tape on heavy trailers including from the period of 1983 to 1985 a 21 percent reduction in the dark and 16 percent reduction in daylight.
- Click [here](#) to download the summary document

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2015 SWOV Report



- Retrofitting older trucks with conspicuity reflective tape could prevent an estimated 481 crashes, 3 deaths and 16 serious road injuries per year. This adds up to an estimated €1.5 billion (US \$1.7 billion) in savings and benefits.
- In the USA each year, around 82,000 large truck and bus crashes result in serious injury, and around 4,000 result in fatalities. Of these, almost 40% occur at dusk or at night.
- The study found around 5,000 people die on EU roads in crashes involving heavy vehicles, and 75% of these fatalities were occupants of other vehicles. These preventable deaths occurred because drivers could not clearly see the sides or rear of trucks or truck trailers at night.
- By adding reflective tape to ALL trucks, trailers, and heavy vehicles, accidents at night can be significantly reduced, and lives can be saved.
- By introducing regulation for the retrofitting of even minimum conspicuity tape requirements on all heavy vehicles, socioeconomic cost savings in both lives and dollars will far outweigh the expense (2:1 benefit:cost ratio).
- Click [here](#) to download the summary document