

# Improving motorcycle conspicuity through innovative headlight configurations

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## Key components of the study:

- Study of motorcycle detectability in three car-headlight environments.
- Comparison of a standard motorcycle headlight and three innovative headlights.
- Beneficial effect of standard yellow configuration on motorcycle detectability.
- Beneficial effect of vertical yellow configuration on motorcycle detectability.
- The advantage of the two configurations is modulated by car-headlight environment.

## Abstract

Most motorcycle crashes involve another vehicle that violated the motorcycle's right-of-way at an intersection. Two kinds of perceptual failures of other road users are often the cause of such accidents: motorcycle-detection failures and motion-perception errors. The aim of this study is to investigate the effect of different headlight configurations on motorcycle detectability when the motorcycle is in visual competition with cars.

Three innovative headlight configurations were tested: (1) standard yellow (central yellow headlight), (2) vertical white (one white light on the motorcyclist's helmet and two white lights on the fork in addition to the central white headlight), and (3) vertical yellow (same configuration as (2) with yellow lights instead of white). These three headlight configurations were evaluated in comparison to the standard configuration (central white headlight) in three environments containing visual distractors formed by car lights: (1) daytime running lights (DRLs), (2) low beams, or (3) DRLs and low beams. Video clips of computer-generated traffic situations were displayed briefly (250 ms) to 57 drivers.

The results revealed a beneficial effect of standard yellow configuration and the vertical yellow configuration on motorcycle detectability. However, this effect was modulated by the car-DRL environment. Findings and practical recommendations are discussed with regard to possible applications for motorcycles.