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Reflective Tape Applied to Bicycle Frame and Conspicuity Enhancement at Night

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Abstract

Objective:

Four studies were conducted to assess bicyclist conspicuity enhancement at night by the application of reflective tape (ECE/ONU 104) to the bicycle rear frame and to pedal cranks.

Background:

Previous studies have tested the benefits of reflective markings applied to bicyclist clothing. Reflective jackets however need to be available and worn while reflective markings enhance conspicuity without any active behavior by the bicyclist.

Method:

In the first study, reflective tape was applied to the rear frame. Detection distance was compared in four conditions: control, rear red reflector, high visibility jacket, and reflective tape. In the second study, the same conditions were studied with night street lighting on and off. In the third study, detection and recognition distances were evaluated in rainy conditions. In the fourth study, visibility was assessed with the reflective tape applied to pedal cranks.

In the first study, the application of reflective markings resulted in a detection distance of 168.28 m. In the second study, the detection distance with reflective markings was 229.74 m with public street light on and 256.41 m with public street light off. In rainy conditions, detection distance using the reflective markings was 146.47 m. Reflective tape applied to pedal cracks resulted in a detection distance of 168.60 m.

Conclusion:

Reflective tape applied to the rear bicycle frame can considerably increase bicyclist conspicuity and safety at night.

Application:

Reflective tape is highly recommended to complement anterior and rear lights in bicycle riding at night.

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