

Improving Cyclists' Conspicuity and Visibility with a Novel Lighting System (NLS)

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Abstract for ICSC

The study evaluated the added benefits of a unique cyclist lighting system with alternating flashing lights (AFL) on the handlebars and the helmet, creating a vertical apparent movement effect. Students viewed short video clips of cyclists approaching the camera location in urban streets with moderate traffic flow. Two studies were performed, in each study there were 72 clips consisting of: 3(different streets) X 2 (Daytime and Dusk hours) X 2 (Cyclist's distance from camera: 60m and 160m) X 3 (Cyclists visibility: no light, flashing light on handle bars, and NLS) X 2 (Same combinations but without a cyclist) . In the first study – **Conspicuity** – subjects were unaware of the study objective and were simply told to note at the end of each 1.0s clip the types of vehicles they saw. In the second study – **visibility** - subjects were asked to press the <space bar> as soon as they detected a cyclist. The video was either terminated with the response or lasted for up to 2s. In each study percent correct identifications were noted, and in the second study detection RT was recorded too.

The results showed that the AFL system improved both cyclist conspicuity and visibility in the more difficult dusk condition. In the first study (conspicuity) detection likelihood with the AFL was significantly better than with the single flashing light or no lights at all, at both the near distance and the far distance. In the visibility study, the cyclist was detected almost all the time at both distances in daylight, thus the AFL had no benefit. However, at dusk detection likelihood was highest with the AFL, especially at the far distance. In that situation the detection RT was also slightly shorter with the AFL. In conclusion, the AFL creates a unique 'signature' that attracts the viewer's attention and sense of identification of cyclists, especially under conditions of poor visibility such as dusk.