

Title

The Effect of Luminance on Driving Speed: A Field Experiment

Authors

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Description

Driving speed is a key determinant of traffic safety. Although much is known about how driver-related factors (e.g., age, alcohol) influence driving speed, less is known about the effects of environmental factors. We examine one such factor: luminance, that is, the light reflected from street surfaces and perceived by drivers. Whereas some studies have found that lower luminance is associated with lower driving speeds, other studies have found that lower luminance is associated with higher driving speeds. Given these mixed empirical findings, the precise nature of the relationship between luminance and driving speed remains unclear. This field experiment aims to clarify the luminance–speed effect. To this end, we will manipulate luminance by varying the levels of street lighting. We will measure driving speed, collecting data on approximately 2.5 million car movements on different road types over a six-month period. We will also record street surface conditions, weather, and car number plates. In addition, we will collect self-reports on driving experience and tendencies from a subsample of drivers. The findings should help explain the mixed results on the luminance–speed effect, which has direct implications for lighting regulations and traffic safety.