

Improving Visual Guidance in Work Zones

For many drivers, work zones at night can be confusing places. For transportation, construction and utility workers, work zones mean increased risk of injury or even death. The combination of ambient darkness, glare from work zone lights, unfamiliar traffic patterns, and the presence of multiple flashing yellow beacons can create visual chaos that can be difficult to decode. Adding to the challenge, performance standards for flashing lights used in work zones only specify minimum intensity requirements with no maximum limits to avoid glare at night. Nor are there requirements for coordinating multiple lights to avoid random, confusing flash patterns.



Subjects maneuver a test vehicle through the work zone during daytime driving conditions.

Working under a grant from the National Institute for Occupational Safety and Health (NIOSH), LRC researchers are conducting investigations to improve worker safety by reducing the chaotic conditions faced by drivers in work zones. In one field study, participants drove along daytime and nighttime work zones delineated by traffic drums and flashing yellow lights. The intensity of the lights and their flashing patterns were changed

Sponsor

National Institute for Occupational Safety and Health



LRC researchers investigate the optimal intensity for flashing lights at night.

systematically. The lights could flash with a random pattern, a synchronized pattern where all lights turned on and off simultaneously, or a sequential pattern where lights flashed one after another along the boundary of the work zone.

Not unexpectedly, drivers preferred lower intensities at night (a peak intensity around 25 candelas), reporting that the lights produced less glare and were easier to drive past than lights having higher intensities. In the daytime, higher intensities (up to a peak intensity of 750 cd) were judged equally non-glaring and easy to navigate through. The random flashing pattern was also judged as the most glaring and the sequential pattern was least glaring, even when the peak intensities were the same. The sequential pattern was also easiest to drive past. The study findings will inform standards for flashing lights that are bright enough to be detected but not too bright nor too confusing to help drivers navigate through work zones without increasing risks to road workers.

Citation

Rea MS, Bullough JD, Radetsky LC, Skinner NP, Bierman A. (In press). Toward the development of standards for yellow flashing lights used in work zones. *Lighting Research and Technology*. <http://dx.doi.org/10.1177/1477153516670935>

