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SAFEWALK® CROSSWALK ILLUMINATOR STUDY

SafeWalk® Crosswalk Illuminator Among Best Performing Illumination Solutions in Recent Illinois Center for Transportation Study

Summary

The Illinois Transportation Institute recently conducted a nighttime study, comparing the impact of various lighting treatments and pedestrian safety countermeasures on driver reaction times at crosswalks. The study found that TAPCO's SafeWalk® Crosswalk Illuminator contributes to highly increased reaction times.

Situation

Though there has been a downward trend in traffic deaths over the last 40 years, according to the National Highway Traffic Safety Administration (NHTSA), the same cannot be said for pedestrian fatalities. A 2017 report by the Governors Highway Safety Association (GHSA) stated that pedestrian fatalities had increased by 27% since 2007, even though there was a 14% decrease in traffic fatalities during the same time.

Pedestrians are especially vulnerable to traffic collisions at night. The GHSA even found that in the United States, roughly 75% of pedestrian fatalities occur after dark.

Concerned by these trends, researchers at the Illinois Transportation Institute at the University of Illinois at Urbana Champaign set out to test pedestrian illumination solutions to recommend new guidelines for pedestrian safety.

Included in this study on pedestrian illumination at crosswalks was TAPCO's SafeWalk® Crosswalk Illuminator.

The SafeWalk® Crosswalk Illuminator enhances pedestrian crossing systems by illuminating pedestrians as they enter the crosswalk, drastically increasing pedestrian visibility with its dual-light technology.

Study

Researchers noted gaps in the existing guidelines for lighting crosswalks. These gaps became the objectives of the study:

- Develop guidelines for lighting crosswalks at both intersections and mid-block crosswalks
- Compare how drivers detect pedestriansunder existing and revised lighting treatment guidelines
- Discover if pedestrian safety can be improved by deploying different lighting treatments

The study was separated into two visual performance experiments: intersection crosswalks and mid-block crosswalks. TAPCO's SafeWalk® Crosswalk Illuminator was used in the second experiment focused on mid-block crosswalks.

The second experiment compared a driver's ability to detect pedestrians under different lighting levels and configurations of overhead lighting at mid-block crosswalks, as well as crosswalk illuminators. The study included the TAPCO SafeWalk® Crosswalk Illuminator as well as another crosswalk illuminator.

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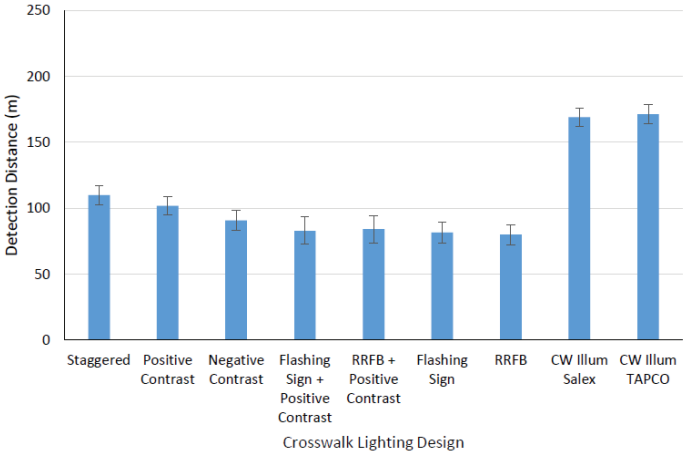
The overhead lighting was tested at three different ambient lighting levels and various system configurations such as staggered, positive contrast and negative contrast. Pedestrian crossing treatments were also tested, including flashing pedestrian signs and rectangular rapid flashing beacons.

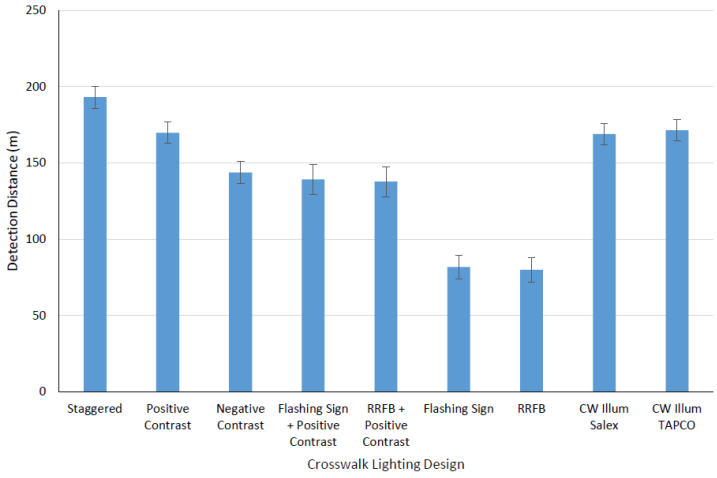
The experiment consisted of measuring participants' detection distances, which is the distance at which pedestrians are identifiable to drivers: the earlier a pedestrian is detected, the greater the detection distance. Participants driving the course would verbally indicate when they could see a child-sized mannequin placed in or near the mid-block crosswalk, with that moment marking the detection distance. This was repeated for each crosswalk illuminator at each light level.

Results

Researchers concluded that detection distances were significantly increased with crosswalk illuminators when combined with the lowest level of ambient overhead lighting. When comparing the two crosswalk illuminators, TAPCO's SafeWalk® Crosswalk Illuminator came out ahead, having the farthest detection distances.

When the overhead lighting was set to a medium light level, crosswalk illuminators ranked high again with increased detection distances. These distances were significantly greater than the remaining overhead lighting configurations and pedestrian crossing treatments. The crosswalk illuminators performed similarly when the overhead lighting was at a high level.





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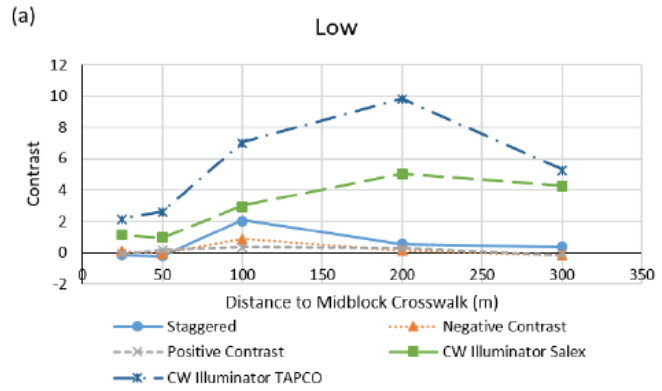
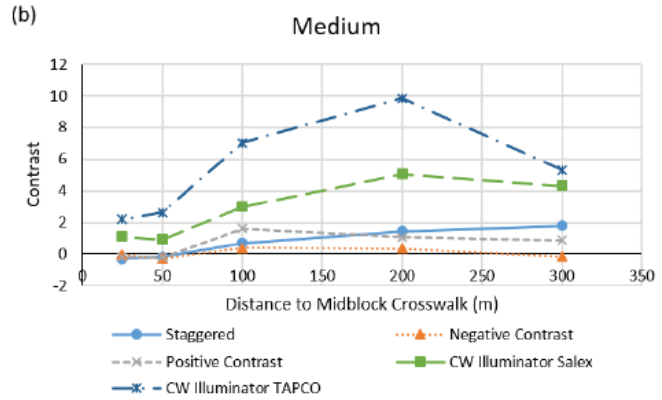
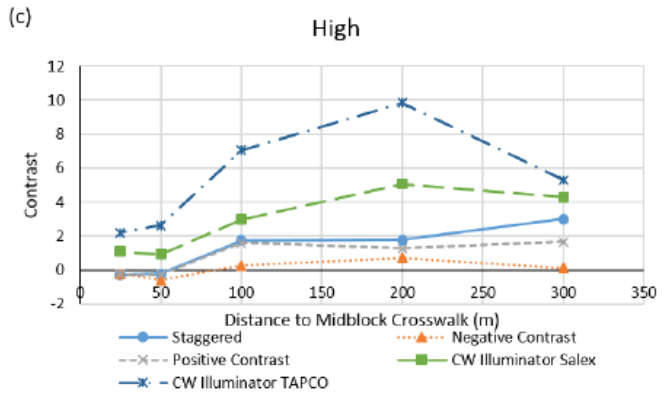
It was also discovered that when the mannequin pedestrian was placed at the entry to the crosswalk, TAPCO's SafeWalk® Crosswalk Illuminator had the highest luminance. Additionally, TAPCO's SafeWalk® Crosswalk Illuminator had the highest contrast compared to every other lighting level and configuration, keeping the pedestrian in positive contrast the entire distance of the crosswalk.







Based on the results, researchers provided recommendations for lighting at mid-block and intersection crosswalks, including:

- Mid-block crosswalks should be illuminated with a minimum vertical illuminance of 10 lux
- When overhead lighting is not available, crosswalk illuminators should be used to provide positive contrast
- Pedestrian crossing solutions should be considered for all mid-block crosswalks, where overhead lighting and crosswalk illuminators can be used in conjunction

Overall, TAPCO's SafeWalk® Crosswalk Illuminator outperformed the other crosswalk illuminator as well as overhead lighting — at varying configurations and light levels. In fact, TAPCO's SafeWalk® Crosswalk Illuminator illuminates the center of a crosswalk to at least 20 Lux on a 2-lane road, twice the minimum recommended level. This study shows that with improved driver detection distances as well as greater pedestrian contrast, the TAPCO SafeWalk® Crosswalk Illuminator makes pedestrians more visible to drivers and ultimately increases pedestrian safety.

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