

Influence of Intelligent Vehicle Headlamps on Pedestrian Visibility in Roundabouts

Roundabout intersections are becoming increasingly utilized in North American highway design because they help promote traffic flow and reduce the severity of vehicle-to-vehicle crashes at roadway intersections. However, the locations of pedestrian crosswalks adjacent to roundabouts are not necessarily intuitive to drivers, nor does overhead lighting always provide optimal visual contrast of a pedestrian against his or her background.

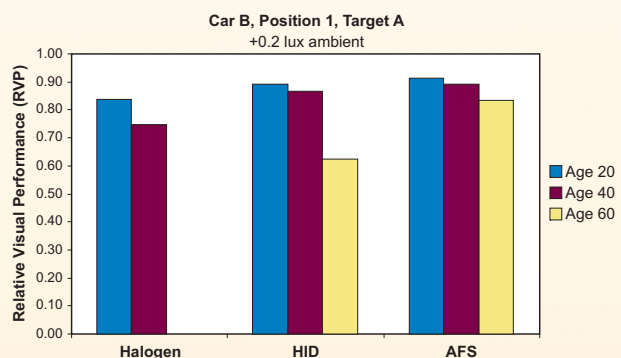
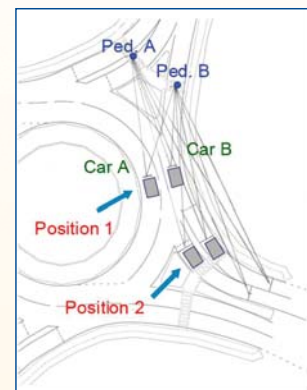


The purpose of this study was to determine how different headlamp technologies perform in the roundabout traffic environment. LRC researchers compared photometric properties of vehicle headlamp systems, including conventional halogen and high intensity discharge (HID) low-beam headlamp systems and intelligent vehicle headlamp systems that might provide optimized illumination when navigating through roundabouts. Relative visual performance analyses were performed based on the geometric characteristics of a roundabout recently constructed in Albany, N.Y.

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Results

Visual performance analyses showed that a driver's ability to see pedestrians was improved with new headlamp technologies such as HID sources and/or adaptive forward lighting systems (AFS) over conventional halogen fixed headlamps, even when fixed roadway lighting is present. As new roadway configurations such as roundabouts are utilized more frequently, it is important to consider vehicle lighting in addition to fixed roadway lighting as a significant part of the solution for adequate visual performance.



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