### Abstract

The objective of this work is to present a concept for a very simple driver interface to be used in a night vision system, and to partially test its effectiveness. The display consists of a pedestrian icon that indicates when there are pedestrians near the future path of the vehicle. The next generation of automotive night vision systems will likely continue to use in-vehicle displays that show enhanced images of the forward driving scene. In some displays there may also be highlighting of pedestrians and animals, which has been argued to be the primary safety goal of night vision systems. There are other design considerations for future night vision displays, such as improving mobility, addressing the driver’s desire for better vision of the road, and providing the driver with a sense of support for subjective situation awareness. In this work, however, we focus on safety considerations.

Eight younger drivers (under age 30) and eight older drivers (over age 60) drove an instrumented vehicle during normal nighttime traffic on a 20-mile route. Seven pedestrians, simulated by inflatable mannequins dressed in dark clothes, were positioned on the shoulders of the road along the route. Subjects drove the route twice and indicated verbally as soon as they saw a pedestrian. On one pass, the pedestrians were all on the right side of the road, while on the other pass some were on the right and some were on the left side of the road. During half of each pass, the pedestrian icon was active, lighting up as soon as the pedestrian was within 150 m of the vehicle. During the other half, it was inactive.

The pedestrian icon improved mean detection distance from 34 to 44 m. The ratio of missed pedestrians decreased overall from 13% to 5%, correspondingly. The improvement may be attributable to the icon alerting the driver to the presence of a pedestrian. In this experimental context, the drivers were probably always more alert to the possible presence of pedestrians than most drivers in the real world, suggesting that the effect of the icon might be even larger in actual use.