By Paul Hughes

The CMOS camera-based system shows tremendous potential to reduce transit bus side crashes. A camera-based system with a 100-degree angle lens can completely eliminate the blind zones on the both sides of transit buses.

That is the finding by Center for Urban Transportation and Research at the University of South Florida. Its recent study for the Florida Department of Transportation (FDOT) compared mirror-based, sensor-based and camera-based systems for side collision avoidance evaluated the effectiveness of camera-based systems by measuring the reduction of blind zones and analyzing the results of controlled driving tests and driver surveys using side view camera systems.

Drs. Pei-Sung Lin, Achilleas Kourtellis and Chanyoung Lee conducted the testing that Bob Westbrook, FDOT transit operations administrator, proactively championed, while Victor Wiley, Safety Director FDOT, Cecil Carter and Carlton Allen from CUTR assisted in implementing this safety research program.

In the controlled driving test, 28 bus drivers demonstrated positive distance/depth perception and lane change maneuvers using side-view camera systems. Most of the drivers were able to adapt to the side-view cameras and quickly learned how to use the system. Vehicle types included ultra-low floor buses, high-floor buses

Where is the blind zone?

The approaching vehicle is not visible to the bus driver. It cannot be seen in the review mirror, but is clearly visible in the camera monitor.

Researchers at CUTR thoroughly examined how side camera-based systems reduced side blind zones for common types of transit buses.

Typical lane change issue: Vehicle not visible to bus and cannot be seen in mirror but clearly visible in monitor.
Using the camera system while the bus was in motion, the drivers could perceive distance similar to the standard mirrors. The side-view camera system gave the drivers a clear view of a vehicle behind that would normally be in the blind zone of mirrors.

Driver survey results confirmed that bus drivers participating in the study valued the benefits of side-view camera systems. The report is available on the CUTR website in its entirety at www.cutr.com.

### Lane Change Risks

A transit vehicle is three times more likely to be in an accident when changing lanes than if the driver continues driving in the same lane. In average daily commutes, drivers change lanes once every 2.76 miles and this frequency increases significantly in suburban rush hour commutes. Many suggest drivers turn their head and look over their shoulder to view the blind spot before making a turn, but that only introduces more risk. The vehicle can travel more than half of a football field in the time it takes to turn to check the blind spot.
One out of 25 accidents on America’s highways today are due to unsafe lane changes and merges; out of the approximate 630,000 automotive collisions every year, 726 passengers die in collisions due to improper lane changes or merges.

Blind Spots

Continued from page 31

**Cameras eliminate blind zone**

The comparison of mirrors and camera systems from this study show that side blind zones exist due to the inability of rear-view mirrors to cover the area, which the side-view camera system can eliminate.

<table>
<thead>
<tr>
<th>Cause</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>Total</th>
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<tr>
<td>Improper driving</td>
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<td>3.57%</td>
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<td>2.54%</td>
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<td>Careless driving</td>
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<td>18.57%</td>
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<td>15.63%</td>
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<tr>
<td>Failed to yield</td>
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<tr>
<td>Improper passing</td>
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<td>0.71%</td>
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<tr>
<td>All other</td>
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<td>Total</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
</tr>
</tbody>
</table>

*Blind spot or inclement weather cited as primary reason*

The comparison of mirrors and camera systems from this study show that side blind zones exist due to the inability of rear-view mirrors to cover the area, which the side-view camera system can eliminate.

Side-view camera systems can save lives if more transit agencies adopt their use.

Paul Hughes serves as Specialty Vehicle Manager for VelVac

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