



**Summary of NTSB Report
on the Use of Commercial Vehicle On-board
Video Systems for Accident Investigations**

Background

The National Transportation Safety Board (NTSB) has investigated many highway accidents where onboard video systems recorded critical crash-related information. This safety report discusses two recent crashes where continuous video systems were installed on commercial vehicles.

This report summarizes the analysis of the onboard video systems from these two crashes in particular. Further, to advance biomechanical and pediatric trauma-based research, it presents the video analysis and subsequent extensive injury documentation from the Port St. Lucie investigation. Port St. Lucie buses were equipped with a four-camera system from Seon.

Key Findings

- 1. Onboard video systems can provide valuable information for evaluating circumstances leading to a crash, as well as critical vehicle dynamics and occupant kinematics data for assessing crash survivability.**

The Seon video recording system in the Port St. Lucie crash captured all three phases of the crash, including pre-crash driver and passenger behaviors and vehicle motion; vehicle and occupant motion during the crash; and post-crash events, such as passenger evacuation, short-term injury outcomes, and emergency response.

- 2. Video systems when combined with a driver feedback program can provide a long-term safety benefit for equipped vehicles.**

A recent study examined 10,648 crashes involving heavy trucks and buses from the National Highway Traffic Safety Administration General Estimates System (NHTSA 2011) from 2010 to 2012. The event-based video system, combined with the driver behavior modification system, accounted for estimated reductions in fatal and injury crashes of 20 percent and 35 percent, respectively.

- 3. The use of continuous video systems data from buses can serve as the foundation for a multidisciplinary approach to improving transportation safety.**

Camera footage was used to determine the range of motion and injury in a side-impact collision when vehicle occupants are using safety restraints or not. It was

also valuable in predicting likely injuries in future crash situations. Video analysis and subsequent extensive injury documentation from the Port St. Lucie investigation are presented to advance biomechanical and pediatric trauma-based research.

Video systems serve as a pro-active tool to identify and reduce risky driving behavior, such as speeding, distracted driving, or drowsy driving.

4. Continuous video systems provide visibility of the accident and eliminated the need for forensics work typically required to document injury causation.

The continuous video system from the Port St. Lucie crash investigation provided visibility of the event as it was happening and eliminated the need for the forensics work traditionally required to quantify occupant motion and document injury causation. In the videos, initial positions, trajectories, and full occupant motion were quantified relative to the vehicle interior.

The video evaluation revealed many of the traditionally unknown aspects of vehicle motion, occupant motion, and injury causation. If maintained on a larger scale, such video evidence would provide a wealth of recorded crash and injury data to the safety community.”

5. Collecting and documenting on-board video recordings, including crash information, developing the information into a useful form; and distributing these critical data are essential to the process of improving occupant protection systems.

The NTSB recommends that NHTSA incorporate into its existing crash database systems, with appropriate access controls, standardized procedures for collecting and using pertinent video recordings, injury information, and crash data from video-equipped buses, consistent with privacy regulations and policies.

Key Recommendation to American Public Transportation Association

Encourage your members to ensure that any on-board video system in their vehicles provides:

- 1) Visibility of the driver and of each occupant seating location
- 2) Visibility of the forward of the vehicle
- 3) Optimized frame rate, and low-light recording capability.