



**Homeland
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Science and Technology

U.S. Department of Homeland Security



System Assessment and Validation for Emergency Responders

The U.S. Department of Homeland Security (DHS) established the System Assessment and Validation for Emergency Responders (SAVER) Program to assist emergency responders making procurement decisions.

Located within the Science and Technology Directorate (S&T) of DHS, the SAVER Program conducts unbiased operational tests on commercial equipment and systems and provides those results along with other relevant equipment information to the emergency response community in an operationally useful form. SAVER provides information on equipment that falls within the categories listed in the DHS Authorized Equipment List (AEL).

Information provided by the SAVER Program will be shared nationally with the responder community providing life- and cost-saving assets to federal, state, and local responders.

The SAVER Program is supported by a network of technical agents who perform assessment and validation activities. Further, SAVER focuses primarily on two main questions for the emergency responder community: "What equipment is available?" and "How does it perform?"

For more information on this and other technologies, please see the SAVER Web site or contact the SAVER Program Support Office.

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SPAWAR



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TechNote

In-Car Camera Systems

Background

An in-car camera system is a Closed-Circuit Television (CCTV) system designed specifically for use in patrol cars to record traffic stops and other police/civilian interactions. The camera systems can provide audio/visual evidence in an investigation, document officer actions, and protect officers against false allegations.



CCTV System

The first in-car camera systems were relatively large, required multiple cables, and part of the system had to be mounted in the trunk. Modern systems are much smaller and can be mounted inside the windshield area on the dashboard, console, or overhead.

According to the International Association of Chiefs of Police (IACP) in the May 2001 *Use of CCTV Cameras in Law Enforcement* national survey, the most frequent use of CCTV/video technology by law enforcement agencies is in patrol cars. In the Fall 2005 IACP survey, *Identifying Critical Technology Needs*, in-car camera systems were reported as the most imperative technology needed by law enforcement agencies. As technology advances, the in-car camera system is rapidly becoming a standard safety tool in law enforcement.

In-Car Camera System Components

An in-car camera system typically includes a forward-facing camera, a monitor, a wireless microphone, and a video recorder all linked together electronically.

These cameras are designed to withstand harsh conditions (e.g., shock, vibration, heat, humidity, and liquid splash) with no compromise in performance. Typical cameras are equipped with automatic and manual focus, automatic color adjustment, and automatic light exposure. Cameras with night vision capabilities are available and provide better images in the dark or other low-light conditions. A high-quality, color LCD monitor can be installed in the car to monitor live video and audio and for play back of recorded images and sound. Microphones are critical components of the in-car camera system. The IACP recommends, at a minimum, a wireless microphone operating on the 900 MHz band that utilizes digital spread spectrum technology for clarity. Interior microphones are also recommended to record the audio inside the car.

Implementation Considerations

In-car cameras are typically mounted on the dashboard, console, or overhead to provide a view through the windshield to record incidents; the camera can

capture a clear view of the car in front of the patrol car, including the occupants of that car and its rear license plate without blocking the officer's view through the windshield. Systems with a second video input can allow a view of the rear seat or an interior view of the police car. The location of the monitor is selected carefully to maximize visibility and safety.

Currently, a majority of police agencies' in-car camera systems use VHS or Hi-8mm tapes. These analog tapes generally provide adequate image quality and have a long, proven history with law enforcement agencies, prosecutors, and the courts. However, handling and storing large numbers of videotapes can require significant resources in both employee time and physical space within a facility.

Digital camera systems and/or digital storage systems are now widely available and offer a number of benefits, including higher storage capacity, higher quality video, easier sharing of video with no loss of quality, and greater durability. Digital storage does not require the physical storage space of a videotape library; however, an agency will need to acquire and maintain high-capacity servers and asset management software in order to store, organize, and retrieve the digital video files.

The data from digital camera systems can be transferred from a vehicle to the server three ways:

- *Hard-wired Ethernet.* A cable connecting the off-duty car's camera system to the police station Ethernet system allows the video to be uploaded. The camera system is then empty and ready for the next shift.
- *Wireless Ethernet.* Automatic wireless upload begins when the car is within range of the hotspot. It continues until all files are transferred or the car drives out of range.
- *Removable Hard Drive.* The in-car camera system's hard drive is removed and exchanged for a blank drive. The data from the camera system's hard drive is transferred to the server



for storage and analysis. After erasing the old data, this hard drive can be reused in the field.

Both digital and analog storage systems provide similar functions; however, the move to digital storage allows for easier and more efficient searching, viewing, and sharing of the audio/video data.

Operational Use

In-car camera systems are a vital tool for gathering intelligence and documenting events. With recent advances in wireless video technology, images and video files can be instantly transmitted to a central location where they can be compared with state records, suspect files, or terrorist watch lists. Audio tracks and visual images that are captured can be compared to existing voice samples and images of known suspects.

Conduct of officers, citizens, and prisoners can be scrutinized after an incident. Often, the audio track alone can be very helpful in re-creating a situation or specific incident. Additional capabilities are being designed and integrated with in-car video systems, such as optical character and facial recognition, to aid officers in their job.

A 2000 National Institute of Justice study on police technology found that only 3,400 (11 percent) of state police and highway patrol vehicles were equipped with in-car camera systems. By 2004, over 17,500 (72 percent) of state patrol vehicles had cameras installed in them according to an IACP survey. The benefits that arose from use of these cameras include:

- Increased conviction rates and less time in court
- Increased officer awareness/safety
- Improved agency accountability
- Enhanced in-service training
- Improved community/media perceptions
- Advanced prosecution/case resolution.

Resources

International Association of Chiefs of Police
www.iacp.org

IACP/COPS Technology Technical Assistance Program
www.iacpresearch.org

Justice Technology Information Network
www.nletc.org