ROAD AWARE

HOW IN-CAR VIDEO SYSTEMS SUPPORT MODERN POLICING

MOTOROLA SOLUTIONS

IN-CAR VIDEO PLAYS A CRITICAL ROLE IN MODERN POLICING

HELPING FRONTLINE OFFICERS STAY SAFE WHILE EXECUTING THEIR DUTY, VEHICLE-MOUNTED CAMERAS – PLUS ASSOCIATED RECORDING AND VIDEO MANAGEMENT SYSTEMS – SUPPORT INCREASED SITUATIONAL AWARENESS AS AN INCIDENT UNFOLDS.

A valuable source of actionable intelligence before, during and after an incident, today's in-car video solutions can increase crime detection rates. They also enable more efficient prosecution of judicial cases, saving time for busy investigative teams and reducing sources of human error. In parallel, they can promote improved professional standards while enhancing transparency and trust in the police from the public, judiciaries and other stakeholders.

This paper offers an overview of the capabilities and benefits of in-car video systems in a law enforcement environment. It explains how integrated video acquisition and management solutions streamline workflow for busy officers – allowing police forces to make optimal use of staff time and keep police on the streets for longer. It also outlines the potential for vehicle-mounted cameras to be integrated with other policing solutions as part of an integrated technology ecosystem.

Finally, we provide a brief introduction to the latest generation of in-car video systems from Motorola Solutions. Designed specifically for dependable operation in real-world policing environments, these rugged systems offer significant advantages in terms of image quality, reliability and workflow efficiency over previous-generation technologies.

POLICE CARS AND MOTORCYCLES PATROL ALMOST A QUARTER OF A MILLION MILES OF UK ROADS AND MOTORWAYS

ANTICIPATING THE UNEXPECTED

OUT ON PATROL, ANYTHING CAN HAPPEN. SEEMINGLY MUNDANE SITUATIONS CAN ESCALATE TO LIFE-THREATENING IN SECONDS, ENDANGERING POLICE OFFICERS, OTHER ROAD USERS AND PEDESTRIANS AS WELL AS VEHICLES AND PROPERTY.

Police cars and motorcycles patrol almost a quarter of a million miles of UK roads and motorways. Each year, officers deal with incidents ranging from speeding motorists and road traffic accidents to the pursuit of suspect motor vehicles.

In this inherently dynamic and unpredictable environment, reliable visual evidence – either still images, or now much more commonly video footage – plays a critical role in helping police and judicial services review and analyse what may be a complex chain of events.

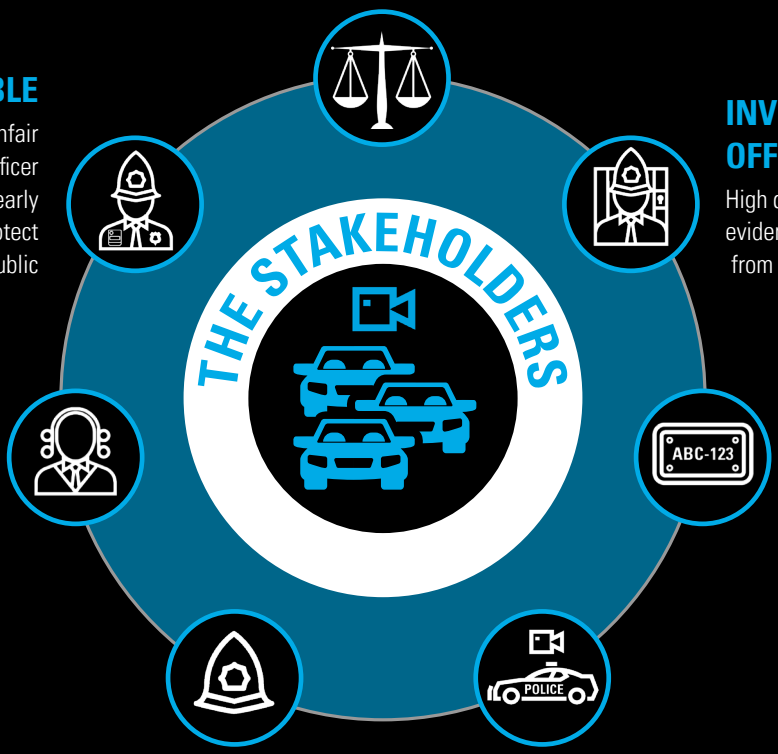
The use of vehicle mounted cameras dates back to the 1930s, when the first 'windshield camera' taking still photographs was designed in the United States to support law enforcement officers on the road. It's also documented that in 1939 a US Highway Patrol officer used his own personal movie camera while working.

During the 1960s the use of 'dashcams' became increasingly prevalent with law enforcement agencies in several US states. Since the 1980s video recording has been a prevalent part of policing the roads in many countries including the UK, where dedicated systems are widely deployed by most forces in police cars, custody vans, motorcycles and other vehicles.

PROVIDING AN UNAMBIGUOUS RECORD

Supporting officers' safety and real-time decision making, properly specified and operated video systems are a crucial source of secure, tamper-proof evidence to accelerate the successful prosecution of offenders. There are also several other uses for recorded video. These range from driver training to demonstrating that due process has been followed at the scene of an incident.

WHO NEEDS IN-CAR VIDEO?



LEGAL TEAM

More rapid, efficient resolution of cases

CHIEF CONSTABLE

Protect officers from unfair claims; enhance officer efficiency; support early convictions and protect the public

INVESTIGATING OFFICER

High quality video evidence rapidly available from anywhere

PROSECUTOR

Ready access to reliable evidence; facilitate early pleas to save time and prosecution costs

TRAINING

Easy access to video footage to support driver training programmes

SUPERVISOR

Support debriefing and driving performance reviews to enhance officer skills; investigate complaints

FLEET MANAGER

Promote enhanced driving standards; support collision reviews; save time with easy installation and maintenance

DESIGNED TO ADDRESS TODAY'S LAW ENFORCEMENT NEEDS

DASHCAMS HAVE BECOME A POPULAR TECHNOLOGY WITH CONSUMERS AND BUSINESS USERS ON THE ROAD.

Storing footage in internal memory or on a removable memory card, these relatively inexpensive cameras are typically of adequate image quality to record video that may be used in the event of insurance claims or to dispute traffic violations.

However it is important to differentiate these low-cost consumer products from specialist in-car video solutions. The latter are expressly designed for reliable performance in demanding mission-critical police and law enforcement applications.

Let's look a little closer at the anatomy of a typical dedicated in-car system.

IN-CAR VIDEO IN CLOSE-UP

WHILE MANUFACTURERS' INDIVIDUAL HARDWARE IMPLEMENTATIONS VARY, THE MAJORITY OF POLICE IN-CAR VIDEO SYSTEMS FEATURE THESE BASIC BUILDING BLOCKS:

One or more **cameras** mounted at various points on the vehicle. Supplementing a dashboard-mounted camera that provides a view of the road ahead, additional cameras can offer rear and side viewpoints for all-round situational awareness. A further camera inside the vehicle's cabin can give coverage of the driver and individuals seated in the rear, sometimes with IR illumination for unimpaired night vision. Many solutions include a microphone to capture audio, further augmenting the evidential value of recorded video footage. Some systems also capture relevant metadata such as vehicle speed and GPS information. Additionally, the ability to integrate with body-worn cameras provides a common timeline of captured evidence.

A **user interface** – either a computer-style keyboard, or more commonly a graphical touch panel display – to control system functions including log-in, record start / stop, review recorded footage and user preferences.

A **recording system**, storing video either on internal memory, a hard drive or other device that can be physically removed from the vehicle at the end of an officer's shift. More modern solutions often securely encrypt recorded video to reduce the risk of evidential tampering or cyberattacks.

THE NEED FOR CLARITY

THE PERFORMANCE OF ALL IN-CAR VIDEO SYSTEMS – AND THEIR VALUE IN A LAW ENFORCEMENT ENVIRONMENT – IS LIMITED ULTIMATELY BY THE IMAGE QUALITY OF THE CAMERA ITSELF.

Today, many police forces in the UK are still using legacy in-car systems that in some cases may be a decade old, or even more. Picture quality achieved with these outdated camera products may fall short of results achievable with a modern smartphone capable of capturing Full HD or 4K video.

This limitation has obvious consequences in a policing environment. Poor quality, low resolution footage may not meet sound evidential standards, failing to support reliable identification of vehicle number plates or human faces. In addition, previous-generation cameras often perform poorly at night or in dark environments, such as in bad weather, underground, in a road tunnel, or inside the cabin of the vehicle itself.

Image quality aside, performance in a road-based environment is governed by the field of view captured by the camera. A broad panoramic view gives an officer enhanced overall situational awareness. Equally, it will not discern small details – such as characters on a licence plate or the face of a driver behind the wheel – where a zoomed-in close-up view is needed.

ADDRESSING THE WORKFLOW EFFICIENCY CHALLENGE

LACK OF TIME IS ONE OF THE MOST COMMONLY REPORTED CHALLENGES FACING TODAY'S POLICE OFFICERS, WITH ADMINISTRATIVE ACTIVITY REPRESENTING 27% OF OFFICER TIME OR AROUND 2.5 HOURS PER SHIFT (SOURCE: NATIONAL POLICING IMPROVEMENT AGENCY).

A rising burden of administrative tasks limits the number of hours an officer can be out on patrol safeguarding road users and communities.

This operational challenge is evident in the workflow for capturing and managing in-car video content that typically comprises a significant number of separate steps. At the start of their shift, an officer will typically log on to the system in their vehicle via a dash-mounted touchscreen or control panel. This process may include inserting a portable hard drive or USB device that's used to store footage captured by cameras in the vehicle. Recording may be started and stopped by the officer. This can result in several video streams, documenting the situation from multiple viewpoints – looking forward, to the rear, around and potentially inside the vehicle itself.

> "The system genuinely is one of the best bits of kit we've got that helps us do our job better. It records three viewpoints – in the vehicle, in front of and behind the vehicle. We find it invaluable in situations like car chases. As soon as the blue lights go on recording starts automatically, and the 30-second pre-record function is very valuable indeed. Every time recording is stopped, the system immediately gives you the option to categorise that clip. And by the time an officer gets back into the office once they've parked, all the material is already uploaded: it's very good to have it exactly where you want it to be."
>
> **Sgt Cameron Buchan,**
> **Roads Policing Unit,**
> **West Yorkshire Police.**

Returning to base at the end of their shift, the officer must then dismount the storage medium that holds recorded video footage. Attaching the storage device to a networked computer, the officer then manually manages the process of transferring (or 'ingesting') footage to a server or video management platform, marking or tagging scenes of interest as appropriate for later evidential purposes. Selected clips are then typically transferred to individual CDs, DVDs or external networked storage for distribution to other team members as required for subsequent investigation of an incident.

Depending on the the number of recordings, the size of each file and the quality/ resolution of each clip, this process may take a significant amount of time. From several hours of video captured during a shift, there may only be a few minutes of footage that is directly relevant. Time-pressed officers may consequently 'cherry-pick' clips for burning to disc, potentially ignoring other footage that could prove highly relevant at a later date.

In common with the employees of other organisations, police officers exhibit a wide range of attitudes to technology and its use in the workplace. While many serving officers are extremely comfortable in today's digital world, others may feel less at home with computers, apps and mobile devices. Aside from their initial reluctance to the adoption of new technology, staff with less highly developed IT skills may take longer to perform routine tasks. They may also be more inclined to make manual errors while operating functions on an in-car touch panel or keying information into a database PC.

SHARING CRUCIAL VIDEO FOOTAGE IN REAL TIME

AS MENTIONED ABOVE, MANY IN-CAR VIDEO SYSTEMS SUFFER FROM A FUNDAMENTAL RESTRICTION TO THEIR OPERATIONAL EFFECTIVENESS IN A POLICING ENVIRONMENT.

Unlike a smartphone camera connected to the mobile network, they're incapable of exchanging information with the outside world. While recorded video footage can be reviewed by an officer in the vehicle, it is inaccessible to anyone else until it's physically transferred from the car or bike to a police station computer or video management platform.

To address this limitation, a new generation of in-car video systems – such as the M500 from Motorola Solutions – offers the ability to securely livestream video captured in the vehicle over a mobile broadband connection. Equally, they enable recorded video files to be uploaded wirelessly to a video management platform while a vehicle is still out on patrol – saving valuable time for officers and colleagues back at base.

OBSERVATION BECOMES ACTION

INTRODUCING IN-CAR VIDEO BY MOTOROLA SOLUTIONS

Representing a leap forward in awareness, safety and workflow efficiency, the latest generation of in-car video systems from Motorola Solutions assure dependable performance in the most demanding situations.

Built on years of extensive testing with real-world users, they're ergonomically designed to support safe, accurate operation in pressured environments where busy officers are dealing with multiple tasks.

There's a choice of durable front-facing, cabin and external zoom cameras that capture crisp, high-resolution footage to document events precisely as they unfold. The seamless solution can also be integrated with officers' body-worn cameras, capturing video from multiple viewpoints and automatically synchronising footage for playback and sharing.

In a leap forward from previous-generation in-car solutions, video can be live-streamed over the air from the vehicle and uploaded via broadband connection directly into the video management platform.

Recordings can also be securely uploaded over Wi-Fi and LTE when the vehicle returns to base, or transferred manually to a back office server via an encrypted USB memory stick. With footage made available online via the Force's network, it's readily available to authorised internal users or external agencies without the need for travelling to specific sites.

Find out more about in-car video systems from Motorola Solutions at:
www.motorolasolutions.com

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