



IN-VIEW: BWC AND IN-CAR VIDEO CONSIDERATIONS

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Law enforcement agencies and community leaders recognize that body-worn cameras (BWCs) and in-car video systems can promote transparency, officer safety, agency development and reform, efficiency, and officer accountability. When considering acquiring BWCs or in-car video systems, or integrating the systems together, agencies must consider the unique capabilities of each. In this article, we briefly describe BWCs and in-car video systems, and then we discuss aspects of implementing BWCs, in-car video systems, or both. We cover consideration and principles that law enforcement agencies should consider based on practice and research. This discussion is not exhaustive, but it provides an accessible resource for law enforcement agencies and their stakeholders to start or further discussions on the implementation or enhancement of either system.

OVERVIEW OF BWC AND IN-CAR VIDEO SYSTEMS

BWCs are video and audio systems that capture both image and sound from a single device worn by an officer. Their use has become more popular in the last several years due to increased media, community, and law enforcement stakeholder attention on interactions with the public. In a nationally representative survey conducted in 2016 - Law Enforcement Management and Administrative Statistics Body-Worn Camera Supplement (LEMAS-BWCS) - approximately 49 percent of responding law enforcement agencies indicated they had acquired BWCs. BWCs come in various shapes, sizes, and capabilities depending on the vendor; there are currently more than 60 commercially produced BWCs.¹ BWCs are portable and mounted on an officer in various locations (e.g., chest, epaulette, head) based on vendor² and department requirements. BWCs capture the video and audio from the officer regardless of officer location. As an example, the officer could be inside a building, inside a house, or on foot patrol away from any department equipment or infrastructure, and the BWC will capture video and audio. Depending on the BWC vendor and capabilities, media are captured and stored on the device, which are later downloaded and transferred to an internal server or cloud-based solution. Typically, downloading requires a physical connection to a docking station. Wireless uploading is available and is likely to increase in use as technology develops and as remote-area broadband connectivity and bandwidths continue to improve.

Dating back to the early 1990s, **in-car video systems** are video and audio systems that are mounted in various fleet vehicles. In-car video systems are relatively more common than BWCs, with 70 percent of 2016 LEMAS-BWCS responding agencies indicating they had acquired car dashboard cameras. The types of equipment vary in size, shape, and capabilities based on different vendors and can include multiple cameras and audio devices. The cameras are hardwired into the vehicle and typically mounted on the front dash or interior of the vehicle to provide a visual reference toward the front. Additional cameras are often mounted facing the rear or rear passenger compartment. Media from in-car video systems are typically stored in the vehicle equipment until downloaded later. Similar to BWCs, download options vary across vendors, depending on department IT infrastructure.

CONSIDERATIONS

INTEGRATION

Law enforcement agencies considering integrating BWCs with in-car video systems often find that integration is preferable when fiscally possible. Integrated systems can be configured to communicate with each other and create an “all-in-one” storage space. There are considerable advantages for such consolidated digital data, including responding to open records

¹ Hung, Vivian, Steven Babin, and Jacqueline Coberly. "A market survey on body worn camera technologies." Johns Hopkins University, Nov (2016).

² Each vendor or company has some similarities and differences in equipment and options for in-car video and BWC systems.

requests (FOIA), and more easily sharing digital evidence and in-house video review (e.g., evaluation, auditing) for improvements, accountability, and training. For example, [the Park City Police Department](#), Utah, integrated BWCs with the agency's existing in-car camera system to allow for continuous video coverage from inside and outside the perimeter of its vehicles.

Outside of the costs of equipment, one of the biggest considerations is whether the vendor provides the needed or desired specifics for integrating BWCs and in-car video systems.

“Integrated body worn and in-car camera systems has been a game changer for our department on a number of levels. The ability to view multiple time-synced cameras and angles on a single screen allows for a clearer picture of what is occurring during an incident. From an administrative and clerical level, a single software system to share, redact and compile evidence not only saves time and resources, but simplifies an already complicated and burdensome public records request process.” – Director of Public Safety Ryan Banaszak - Sturgis Police Department, Sturgis, Michigan

Some agencies prefer separate vendors for BWCs and in-car video systems as a failsafe for potential malfunctions with one type of equipment—in the hopes the other will capture the needed video. Non-integrated systems may also be an agency's only option because additional resources including time, personnel, and money are often needed to integrate the two systems if the vendors or system requirements are different. Agencies should also consider the potential impacts to current infrastructure, operations, and practice.

VIDEO CAPTURE

BWCs are mobile and capture video and audio from an officer's location. The field of view can vary across BWC models but typically will cover approximately an 180° field of view. Mounting options can impede or improve video capture depending on location. Many have noticed that certain activities in the field (e.g., drawing a conducted energy device or weapon, activating radio contact) can obscure the field of view based on BWC placement on the officer. Agencies should rigorously test and evaluate equipment options to determine which vendor will provide them with the most suitable mounting for their respective agencies to capture desired footage. BWCs are battery operated and thus require charging. Different BWC models have different amounts of operational time available on a full charge, depending on activation policies, weather, and resolution settings. Testing and evaluation of BWCs should include, at a minimum, view capabilities, mounting options, ease-of-use, and battery life.

BWC video capture, Sturgis Police Department, Michigan



In-car video systems are typically hardwired into vehicles and have a limited field of view based on mounts and vehicle positioning. In-car video systems typically capture audio and video together. Many agencies have described problems with the portable audio devices “cutting out” because of a malfunction or because of the officer moving a specific distance from the vehicle. This has led to questions and concerns regarding whether an officer terminated the audio or it cut out because of a true technological problem, such as distance.

In-car systems can provide a unique perspective on incidents including speeds, erratic driving, GPS locations, and braking.

In-car video capture, Sturgis Police Department, Michigan



Both BWCs and in-car video systems offer the option of automatic initiation (auto-trigger) technology to ensure cameras are activated when needed. To learn more about auto-triggering capabilities, see the [*In View: Body-Worn Camera Auto-Triggering Technologies.*](#)

FINANCIAL

Costs vary for both BWC and in-car video systems depending on the vendor and whether an agency is replacing an older system or starting from scratch. Other costs to consider include infrastructure, network capabilities, installation, data storage, and personnel costs. An agency acquiring a new system will need to understand what the ongoing costs (sometimes called “legacy costs”) will be after the initial purchase. As with any new and continuing programs (computers, radios, vehicles, etc.), video systems will carry legacy costs, including adding personnel, replacing equipment, increasing storage capacities, and increasing network bandwidth. Another consideration between the two types of systems is ease of replacement. As portable units, BWCs typically require less installation when making upgrades or vendor changes compared to hardwired in-car video systems.

TECHNOLOGY

DATA & STORAGE

BWCs and in-car video systems both have unique requirements for storing data depending on the vendor and type of storage the agency chooses. Typically, in-car video systems will store larger volumes internally (inside the unit) compared to BWCs; however, both require videos to be downloaded to some type of system in order for footage to be saved. Agencies should discuss this with various vendors and when going through the test and evaluation process. Storage solutions for both types of systems fall into three categories: an in-house server, cloud-based server, or hybrid solution. Similar to choosing a vendor, an agency must consider its need for specific types of equipment and storage when making decisions on BWCs and in-car video systems.

IT INFRASTRUCTURE

Agencies should consider their current IT infrastructure and what an updated or new system might require. The ability to upload raw video and audio footage will be necessary. Depending on the vendor, uploads may be made through an in-house wired or wireless network system or through a mobile data connection. Conversations regarding how, when, and how much data storage and upload bandwidth are needed and feasible. Considering the agencies current IT infrastructure and what upgrades may be necessary are important to prevent connectivity or data issues.

BENEFITS AND DRAWBACKS

Below we pose several benefits and drawbacks of BWCs, in-car video systems, and integrated systems. This list is not exhaustive, but it provides several examples agencies should consider when making decisions on camera systems.

	BENEFITS	DRAWBACKS
<i>BWCs</i>	<ul style="list-style-type: none"> • Captures images and sounds • Portable • Various mounting options on officer • Internal storage • Automated triggers 	<ul style="list-style-type: none"> • Images inside of vehicle, or other tight spaces, may be obscured or blocked • Battery life • Virtually all BWCs are prone to be obscured or knocked off in a hands-on situation • Video captured may need to be downloaded before end of shift based on internal data limits
<i>In-car video systems</i>	<ul style="list-style-type: none"> • Captures images and sounds • Hardwired to vehicle • Fixed mounting position (not portable) • Internal storage • Automatic triggers 	<ul style="list-style-type: none"> • Field of view limited by mounting angle; sound can cut out at a distance from the vehicle • Download types/capabilities could be more expensive and require more bandwidth
<i>Integrated</i>	<ul style="list-style-type: none"> • Captures images and sounds • Hardwired to vehicle and portable • Internal storage • Automatic triggers and camera integration are available features. 	<ul style="list-style-type: none"> • Is more costly and requires storage equipment. Different vendors could create problems • BWC data storage might not be enough for a full shift.

SUMMARY

BWCs and in-car video systems both add “tools to the toolbox” to promote transparency, accountability, officer development, generation of digital evidence, and to enhance efficiency. Although questions about BWC systems and in-car video systems may not have single answers, the specific issues noted in this article are important for agencies to consider as they prepare to implement or expand BWC or in-car video systems. We encourage agencies to deploy both systems if the resources (e.g., funding, staff, IT infrastructure) are available. If that is not feasible, the option that provides the most mobility and the greater ability to capture the video and audio of officer interactions is preferred.

AUTHOR BIOGRAPHIES

Geoff Smith retired as the Director of Public Safety for the City of Sturgis, Michigan, with a force of 21 sworn officers. Geoff has been involved or led several initiatives including in-car systems, BWC’s, and vehicle monitoring equipment. Geoff has been a member of the law enforcement community for over 24 years, holds a Bachelor’s Degree in Management & Organizational Development from Spring Arbor University and is certified as an instructor or specialist in various disciplines including computer and cell phone forensics. Geoff is currently a member of L.E.A.F. which is a group of chiefs, litigation attorneys and the Michigan Municipal League that develops “Best Practices” policies for departments across the State. Geoff has presented on several topics including technology, active shooter trainings, and Body Worn Cameras at annual conferences of the Michigan Association of Chiefs of Police, the Michigan Municipal League, and the IACP. He is also currently 1st Vice President of MACP and a Past President of the WMACP (Western Michigan Association of Chiefs of Police) and has been requested to “mentor” or assist other agencies with implementation of BWC’s.

Dr. Brittany Cunningham is a Research Scientist with CNA’s Institute of Public Research. Dr. Cunningham is an expert in scientific research and analysis and has more than a decade of experience designing, implementing, and managing rigorous research studies and evaluations at the local-, state- and national-level. Dr. Cunningham has led and supported grants and projects from several federal agencies including the Department of Justice, Department of Defense, Department of Homeland Security, Department of Education, and the National Science Foundation. Currently, Dr. Cunningham serves as the Project Director for the Using Analytics to Improve Officer Safety study, funded by BJA, which investigates police incident data to support the development of a risk assessment model to support officers assess risk and take appropriate safety protocols in real time when responding to incidents. She serves as Project Manager for the National Institute of Justice (NIJ)-funded randomized controlled trial (RCT) of the impact of BWCs in the Loudoun County Adult Detention Center, which is one of the first RCTs of BWCs in a correctional setting. Additionally, Dr. Cunningham is experienced in using evidence-based approaches, and quantitative and qualitative analysis to support law enforcement agency operations and organizational reform. Currently, she supports the racial bias audit of traffic stops for the Maricopa County Sheriff’s Office and the assessment of Prince George County’s (MD) Police Department’s policies and procedures it related to police-community relations.

Scot Haug is a 32-year-veteran of law enforcement, having worked in all areas of police operations and technology recently retiring as the Chief of Police of the Post Falls, Idaho Police Department. He is a graduate of the 201st FBI National Academy and has served as a Commissioner for Idaho POST, the agency responsible for all Idaho policing standards and training. Most recently he served as President of the Idaho Chiefs of Police Association. Scot is known for being an effective practitioner-technologist and has significant project management experience. He has served as a technology consultant to company’s such as Lockheed Martin, Booz|Allen|Hamilton and the International Chief’s of Police Association. His technology projects have been featured in Computer World magazine, CEO magazine, and the Harvard University Government Innovators Network. He is co-owner of the consulting firm, Public Safety Insight.