Major Cities Chiefs
and
Major County Sheriffs

Technology Needs – Body Worn Cameras

Major Cities Chiefs and Major County Sheriffs
Survey of Technology Needs – Body Worn Cameras

Major Cities Chiefs
J. Thomas Manger
Chief of Police, Montgomery County, Maryland
President

Darrel Stephens
Executive Director

Major County Sheriffs
Donnie Youngblood
Sheriff, Kern County, California
President

Michael Ferrence
Executive Director

Report prepared by

Lafayette Group

Funding for this report was provided by

Homeland Security
Office of Emergency Communications

DECEMBER 2015

Major Cities Chiefs and Major County Sheriffs
Survey of Technology Needs – Body Worn Cameras

EXECUTIVE SUMMARY

Survey Purpose

In Summer 2015, the Major Cities Chiefs and Major County Sheriffs, in partnership with the U.S. Department of Homeland Security's Office of Emergency Communications (OEC), conducted a survey of members to examine the technology and interoperability challenges involved in implementing BWC programs. The survey did not address the legal, policy, financial, evidentiary, or privacy aspects of any such programs.

Survey Results and Analysis

The following is a representation of the highlights of the results, with a full, detailed report to follow.

- About 19% said that their BWC programs were "fully operational." Nearly 77% either "intend to implement," were in the piloting phase, or have completed the pilot but have not yet started a program. The data indicated that many local agencies are moving forward with implementation, despite of a lack of IT infrastructure and technical solutions to fully support these programs. Only 5% of respondents said they either did not intend to implement a BWC program, or had completed a pilot but chose not to proceed.

- Nearly 70% of respondents recognized a need to expand and improve their IT infrastructure to fully support BWCs. Specific technology gaps they identified included: a lack of data storage capacity, inadequate network or bandwidth capability, and inadequate wireless capacity.

- Issues that surrounded the storage, retention, and transmission of the information captured on BWCs varied greatly, depending not only on technological limitations, but also upon state and local laws, and internal policies. Significant in the findings was that about 54% of the respondents identified current network/bandwidth capacity as "not adequate"; about 46% of respondents put their current storage capacity in that same category. About 30% had not yet determined how they would store data and nearly 45% had not determined what the needed increase in storage capacity would actually be.

- How agencies planned to share video data also varied by agency. Most acknowledged a clear intention to share data with their own internal affairs departments and the District Attorney's office. The ability to access the data to satisfy Freedom of Information Act (FOIA) requests was acknowledged and indicated a need for expanded software (in addition to policies and personnel) to review and redact the footage as needed before public release. Critically, almost 38% of agencies cited an increased need for both basic and advanced training on BWC editing and processing for officers and staff.

Major Cities Chiefs and Major County Sheriffs
Survey of Technology Needs – Body Worn Cameras

Table of Contents

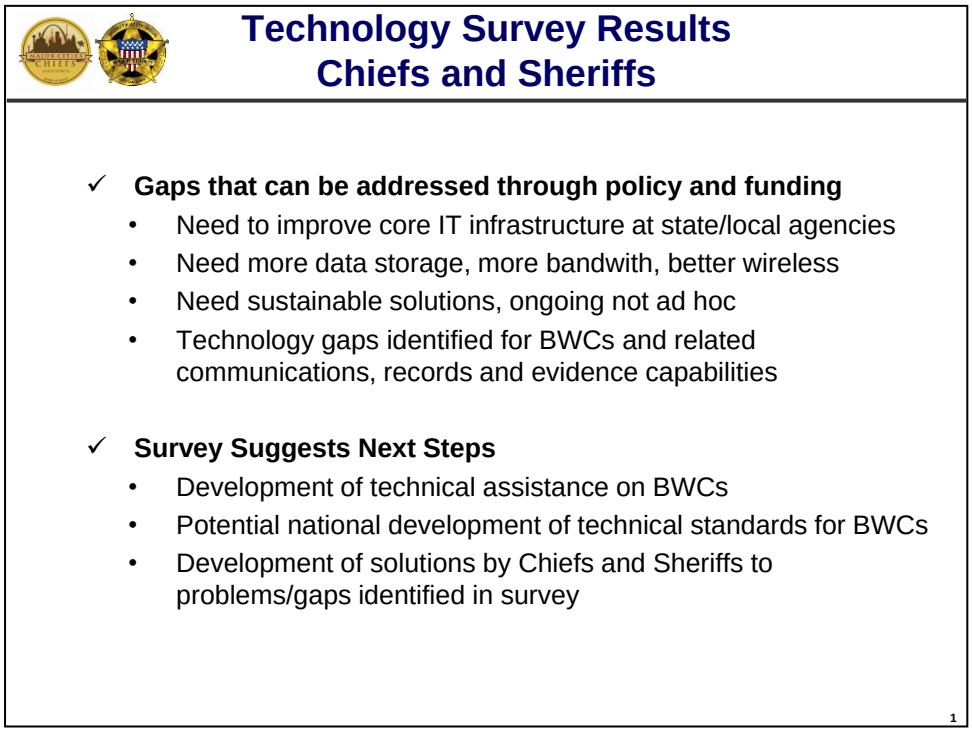
Major Cities Chiefs and Major County Sheriffs
Survey of Technology Needs – Body Worn Cameras

INTRODUCTION AND BACKGROUND

The President's Task Force on Policing in the 21st Century identified the increased use of Body-Worn Cameras (BWCs) as a national priority. To support this initiative, President Obama proposed a three-year, $263-million effort that included $75 million each year for the *Body Worn Camera Partnership Program.*

In June 2015, the U.S. Department of Homeland Security's Office of Emergency Communications (OEC), in partnership with the Major Cities Chiefs' and Major County Sheriffs' Associations, administered a survey to its association members for the purpose of gathering information on the technological and interoperability challenges involved in implementing BWC programs. The focus of the OEC survey was technology and communications requirements to implement this national initiative. For this reason, this survey did not directly address the legal, policy, financial, evidentiary, and privacy aspects of any BWC programs.

The survey went to 67 Major Cities and 76 Major Counties. Seventy domestic agencies had completed the survey at the time of this report.



Major Cities Chiefs and Major County Sheriffs
Survey of Technology Needs – Body Worn Cameras

KEY ISSUES

This report contains the results from the 70 completed surveys were tabulated for this report.

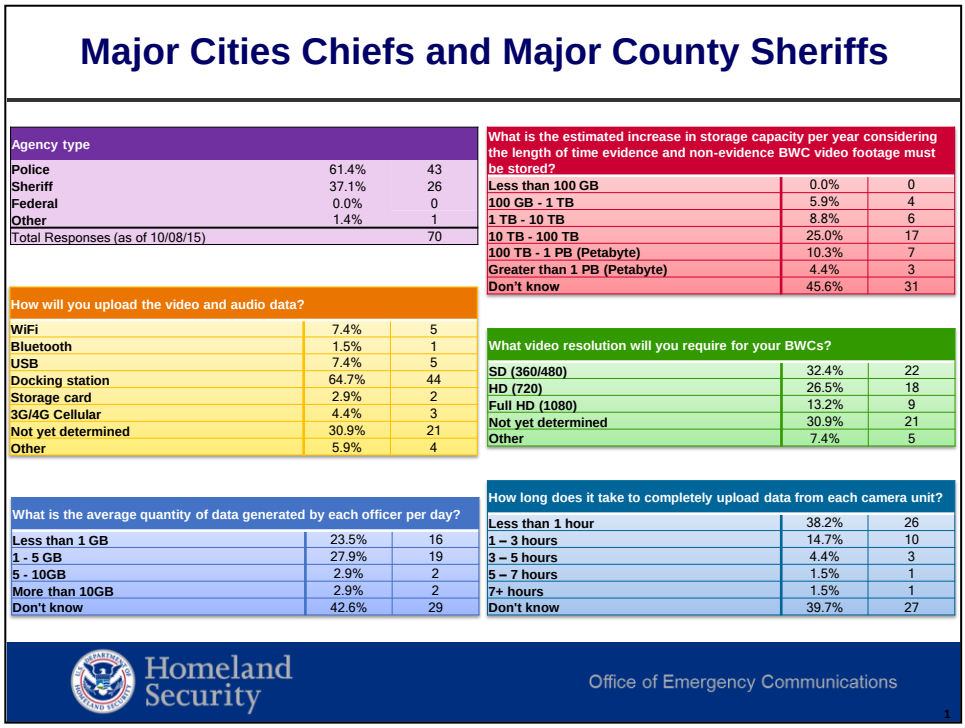
Commitment to Proceed: The survey illustrates reasons for national caution and concern. While 97% of the respondents indicated that they were moving forward with body camera systems, few had determined how technology requirements would be satisfied and what it would cost. More than 70% noted that their current infrastructure was inadequate to handle the requirements of a body camera system. This study shows that the collective launch of BWC programs may be outpacing the technological solutions. In today's environment, law enforcement agencies are moving forward with implementing BWC programs in advance of having all the technical and policy information in place.

Much is Unknown: The survey demonstrates that large gaps exist in both the technical infrastructure, as well as the understanding of the technical requirements for BWC programs. For a significant percentage of the respondents, digital space and technological needs remain largely undetermined or unknown and still require development of technical requirements to support and sustain BWC programs across the nation. Support and guidance is needed on this critical issue, while identifying key interoperability and technology hurdles. The survey results demonstrate that local agencies will require technical assistance and guidance in developing and implementing sustainable BWC programs.

Technology vs. Policy: Technology requirements and policy priorities must be weighed against each other. When infrastructure and staffing requirements are enormous, technology issues may dominate policy concerns. For example, the number of personnel required for reviewing and redacting video may represent excessive costs and thus preclude public release of all videos.

Comprehensive Plan is Required: Police and Sheriff respondents clearly agreed that numerous factors must be considered for a successful deployment of body worn camera systems. These include technological challenges, funding considerations, policy development, community outreach, communications strategies and training. Privacy and legal concerns must also be addressed. For this national effort to be successful, there must be an increased emphasis placed on addressing BWC technology, especially equipment and communications equipment.

Major Cities Chiefs and Major County Sheriffs
Survey of Technology Needs – Body Worn Cameras



Major Cities Chiefs and Major County Sheriffs

Agency type		
Police	61.4%	43
Sheriff	37.1%	26
Federal	0.0%	0
Other	1.4%	1
Total Responses (as of 10/08/15)		70

How will you upload the video and audio data?		
WiFi	7.4%	5
Bluetooth	1.5%	1
USB	7.4%	5
Docking station	64.7%	44
Storage card	2.9%	2
3G/4G Cellular	4.4%	3
Not yet determined	30.9%	21
Other	5.9%	4

What is the average quantity of data generated by each officer per day?		
Less than 1 GB	23.5%	16
1 - 5 GB	27.9%	19
5 - 10GB	2.9%	2
More than 10GB	2.9%	2
Don't know	42.6%	29

What is the estimated increase in storage capacity per year considering the length of time evidence and non-evidence BWC video footage must be stored?		
Less than 100 GB	0.0%	0
100 GB - 1 TB	5.9%	4
1 TB - 10 TB	8.8%	6
10 TB - 100 TB	25.0%	17
100 TB - 1 PB (Petabyte)	10.3%	7
Greater than 1 PB (Petabyte)	4.4%	3
Don't know	45.6%	31

What video resolution will you require for your BWCs?		
SD (360/480)	32.4%	22
HD (720)	26.5%	18
Full HD (1080)	13.2%	9
Not yet determined	30.9%	21
Other	7.4%	5

How long does it take to completely upload data from each camera unit?		
Less than 1 hour	38.2%	26
1 – 3 hours	14.7%	10
3 – 5 hours	4.4%	3
5 – 7 hours	1.5%	1
7+ hours	1.5%	1
Don't know	39.7%	27

DISCUSSION OF SURVEY RESULTS

The data indicate that many local agencies are moving forward with implementing BWC programs despite of a lack of IT infrastructure and clarification of technical requirements. The purchase of BWC cameras is only a single step in building a program; subsequently, there are a plethora of technical issues, which must be addressed in order to support a sustainable BWC program. This survey clearly indicates that local agencies need assistance in the identification of technological issues.

Noteworthy in this survey's results are the nearly 70% of respondents who recognized a need to expand and improve their current IT infrastructure. Specific technology gaps consistently identified throughout the survey include: a lack of data storage capacity, inadequate network or bandwidth capability, and inadequate wireless capacity. Additionally, staff proficiency in performing and managing technological operations such as processing, tagging, categorizing, and transmitting data are also in need of improvement. Issues surrounding the storage, retention, and transmission of the information captured on BWCs varied greatly, depending not only on technological limitations, but also upon state and local laws, and internal policies.

What stands out in this survey is the high number of "unknowns." Law enforcement agencies have not been able to clearly identify all of the gaps, or capture requirements, related to BWC technology and interoperability. For instance, the data clearly show that the quantity of video data being generated by BWC cameras, including the number of hours, video length, and video resolution, is largely undetermined by agencies. The quantity of recorded data is interconnected and will help to determine other technology requirements, such as the amount of bandwidth for data transfer and storage capacity needed, and will ultimately determine the infrastructure required to support a fully operational BWC program. What the data are not clear about is if the agencies who have "not yet determined" these levels may be able to more accurately capture them upon the completion of pilot programs.

A second example is the roughly 44% of agencies who "don't know" what the increase in storage needs will be. Understanding the amount, quantity, and quality of the data being generated by each BWC unit is critical because those factors will impact the data storage and IT needs of each agency, and will, in turn, drive the selection of how best to store that data whether via cloud service or mainframe. Of specific concern is that storage needs are cumulative, and will increase over time depending on how much, and for how long the data are stored. Storage needs may vary among agencies depending on policies established for the retention of data (both evidentiary and non-evidentiary) and purging policies related to BWC programs. But the costs associated with storing such vast amounts of data mean that agencies must make informed choices about data storage, which can easily be the single greatest expense in implementing a BWC program.

The ability to fully integrate this new sophisticated equipment into the emergency communication architecture and to leverage its full potential is also challenging. Almost half of respondents don't know how data will be integrated across multiple existing platforms such as RMS and CAD. The value of BWCs for the entire public safety community goes beyond simple evidentiary and behavior assessment purposes. The ability to integrate BWC video, audio, and GPS data with applications and devices will help to enhance emergency communications and real-time incident management and present a clearer and more complete understanding of each incident. Body-worn cameras will require interoperability not only among disparate body-worn camera platforms but also across multiple devices, applications, and systems. Users need to be able to send and view videos for years to come without stove-piped proprietary software and systems.

The survey included respondents from departments of all sizes and local jurisdictions throughout the nation, each of who are in various stages of program deployment (planning – pilot – operational). In analyzing the data, several takeaways could be identified in the survey results.

THE WAY FORWARD

- Many technology decisions are largely being driven by vendor selection, rather than being driven by identified and articulated technical requirements.

- IT infrastructure needs to be expanded to support BWC programs. Specific technology gaps identified include: a lack of data storage capacity, inadequate network or bandwidth capability, and inadequate wireless capacity.

- Pilot programs can help a department better understand its own technology needs and IT infrastructure gaps.

- Law enforcement will need guidance, training, and technical assistance to increase proficiency and better understand BWC technical requirements.

- System integration and interoperability will require holistic, long-term technology approaches.

- Most agencies lack the system ability to store and process the large amounts of data currently generated by BWCs.

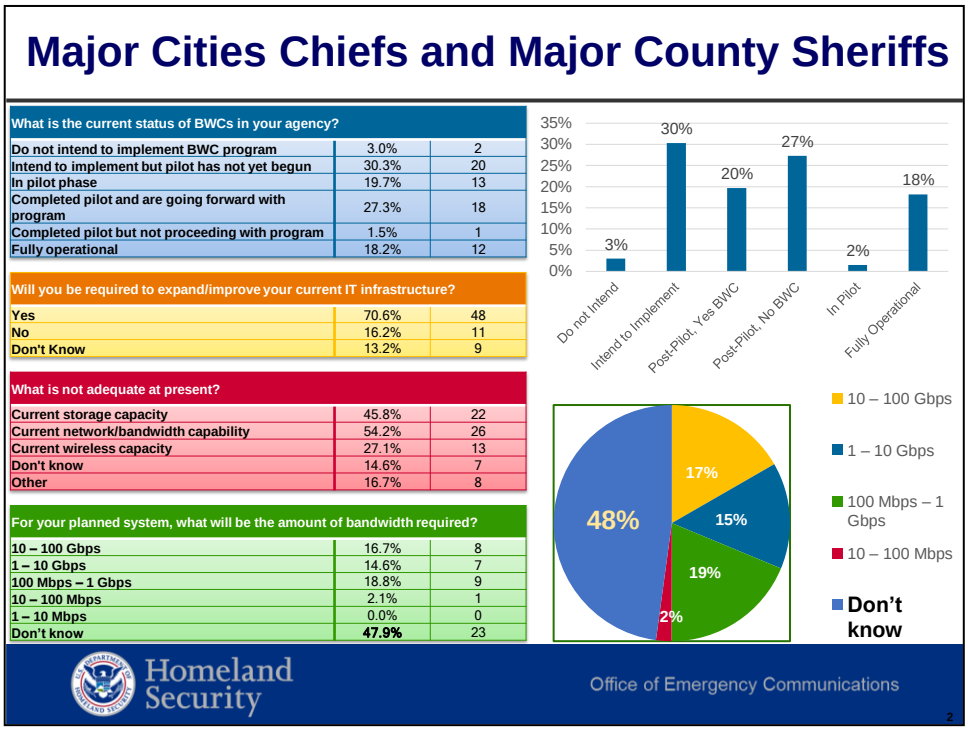
- The effort to efficiently process video data from BWCs, including reviewing and categorizing all video, will require both ongoing training and significant administrative costs.

FOIA requests will likely require substantial time and effort and must be supported by adequate national and state public disclosure laws and internal policies.

It is important to note that this survey focused specifically on the technology related to BWC programs. However, the results pointed to several interrelated issues that were outside of the scope of this survey but greatly impact technological issues nonetheless. First is the need to develop policies and procedures that will support BWC program management. Policy issues such as data retention, data capture, and where data are to be stored will ultimately impact decisions about technologies. Policies regarding the sharing and public release of video in response to FOIA

requests are also an issue for many agencies. As technology continues to advance, so must the policies guiding BWC programs.

The second issue is determining the security of BWC data. Whether transmitting data wirelessly, storing video internally or contracting with cloud storage services, protecting the data and preserving the chain of custody should always be a consideration. As with all digital information, reliable back-up systems must be in place. Because BWC data can easily become vulnerable, security must be a primary factor.



Major Cities Chiefs and Major County Sheriffs
Survey of Technology Needs – Body Worn Cameras

DETAILED SURVEY RESULTS

QUESTIONS 1 – 3: DEMOGRAPHICS

Question 1: ***Respondents***

Seventy-one completed surveys were received from the members of the Major Cities Chiefs' and Major County Sheriffs' associations; while 70 agencies responded, one agency submitted two surveys, bringing the overall number of completed surveys to 71. *All of the respondents were sworn officers whose ranks ranged from officer or deputy to chief executive.*

Question 2: ***Please select your state/province.***

The respondents were from state and local law enforcement agencies in 29 states.

<u>Breakdown by State:</u>

Arizona - 2
California - 14
Colorado - 3
D. C - 1
Florida - 6
Georgia - 1
Illinois - 1
Kansas - 1
Kentucky - 1
Louisiana - 1
Maryland - 4
Massachusetts - 2
Minnesota - 1
Missouri - 1
Nevada - 1
New Mexico - 1
New York - 2
North Carolina - 2
Ohio - 3
Oklahoma - 2
Oregon - 1
Pennsylvania - 2
South Carolina - 1
Tennessee - 1
Texas - 8
Utah - 1
Virginia - 2
Washington - 2
Wisconsin - 2

Question 3: ***Please select agency type.***

Forty-four of the survey's respondents, or 61.97%, were self-identified police departments. The 26 other respondents, or 36.62%, were self-identified sheriff departments. One agency was self-identified as a consolidated county and city police department.

Discussion of Question 3:

The respondents included some of the largest metropolitan agencies (New York, Chicago, Washington, D.C., Los Angeles) in the country, but the results also reflected small- and medium-sized agencies. Respondents were spread across the nation in 29 states, with the largest set of respondents, being from California (14). Significant groups of respondents also came from Texas (8), Florida (6), and Maryland (4). No respondents outside of the U.S. were considered in the results of this survey.

QUESTION 4: WHAT IS THE CURRENT STATUS OF BWCS IN YOUR AGENCY?

Nearly 20% of respondents said that their BWC programs were "fully operational." Almost 38% percent "intend to implement," but had not yet begun a pilot phase; 19.40% and 26.87%, respectively, were either in the pilot phase or had completed the pilot phase and were moving forward with their BWC programs.

About 3% of respondents said they either did not intend to implement a BWC program, whereas only 1.49% said they had completed a pilot but had chosen not to proceed. Slightly less than 3% said they did not intend to implement a BWC program.

Discussion of Question 4:

The data indicate a strong intention to move forward with BWC programs. The data also indicate that many local agencies are moving forward with implementation, despite a lack of IT infrastructure or technical solutions to fully support these programs. Agencies did not expand upon their decisions to not move forward with BWC programs, with or without pilot programs.

A few of the comments for program status mentioned currently being in the procurement phase, doing research into BWC programs, and starting community discussions. One comment noted implementation not feasible due to "infrastructure."

Major Cities Chiefs and Major County Sheriffs
Survey of Technology Needs – Body Worn Cameras

QUESTIONS 5 – 7: VIDEO

Question 5: ***What is the average number of hours of video captured per officer per day?***

Almost half (49.28%) of the agencies estimated the number of hours their officers captured on video to be 3 hours or less per day. The second closest group, at 10.15%, estimated their officers captured 4-6 hours of video daily. Only 2.99 % respondents estimated their officers with BWC captured 7 or more hours of video per day.

Significant in the findings is that 37.68% of respondents had "not yet determined" the average number of hours their officers were catching on video each day.

Question 6: ***What video resolution will you require for your BWCs?***

A slight majority of agencies, 32.8%, stated that their BWCs were using the lowest resolution settings (SD 360/480). A higher resolution (HD 720) was used by 27.14% of the agencies surveyed, but only 12.9% required full HD resolution to support their BWCs.

Significant in these responses were the 30.43% of agencies that have not yet determined what video resolution is required to support their programs. A small percent, 7.25%, stated their cameras have "other" resolution requirements, but did not define what those were. One respondent stated that a decision would be made "pending technology available" and storage costs.

Question 7: ***What is the average quantity of data generated by each officer per day?***

The findings showed that the largest single percentage, 42.03%, or 29 responding agencies, did not know the quantity of data being generated by their officers each day. Those that had determined data quantities estimated either 1 - 5GB per day (28.99%), or less than 1GB per day (23.19%). Only 5.8% estimated generating data in excess of 5GB or more per day.

Discussion of Questions 5 – 7:

The data clearly show that the quantity, video length, and video resolution are largely undetermined by agencies. Not clearly indicated is if the "not yet determined" data generation quantities will be clarified during a pilot program.

Understanding the amount, quantity, and quality of the data being generated by each officer is critical because those factors impact the data storage needs of each agency. The quantity of hours of recorded data, quantity of data, and resolution selected, are all interconnected and will impact other technological issues such as data transfer and storage, as well as the infrastructure needed to support a fully operational BWC program.

QUESTIONS 8 – 10: TAGGING AND CATEGORIZING DATA

Question 8: ***How will officers tag and annotate BWC?***

The data indicated a close divide between the 46.38% of agencies that have determined that officers will tag and annotate BWC footage in the field, either by Wi-Fi or Bluetooth, and the 42.03% that anticipated officers completing the task back at the station, after the video was uploaded. A small number of respondents, 5.8%, had equipment with the capability to tag and annotate data directly from their devices in the field.

The remaining 23.19% planned to use "other" means to tag and annotate data. Several comments detailed "other" to mean completing the task by integrating with a Computer-Aided Dispatch (CAD) system. One respondent specified integration with a Records Management System (RMS). Another cited a combination of different methods based on system and policy. One stated the decision "would ultimately depend upon vendor selection."

Question 9: ***What notes and information (metadata) will your officers add to BWC video?***

This question allowed for multiple answers. Almost half, 47.83% of respondents, attached report numbers to their videos while 43.48% attached video to a case number. A smaller number of agencies notated videos with other information, such as 8.7% to include the suspect's name, and 7.25% included the victim's name. However, 30.43% had not yet determined what notes or metadata would be included with the video. Nearly a third, 31.88% of the respondents, indicated "other" means. Several addressed that with a comment to include a CAD or event numbers.

The results of this question indicated that departments intend to add notes and information via multiple ways, rather than through a single method of cataloging. However, none of the respondents indicated a system that gives them the ability to cross-reference metadata notes (i.e. the ability to cross-reference a case number with a subject's name).

The comments indicate a desire to include the type of event (e.g., call, case, or contact type) because it impacts how the information will be maintained for retention purposes.

Other common metadata reference categories noted by respondents included: incident number, retention category, evidence category, officer's name and badge number, incident type, crime type, assigned BWC, and corresponding radio call. Two respondents noted geo-coding to include the location of the event.

Question 10: ***Which of these items will be added automatically?***

A clear majority, 56.25%, of agencies had not yet determined what information would be added automatically to the data. Smaller numbers determined that the report number (13.04%), case number (10.14%), victim's name (4.35%), or suspect's name (5.8%) would be added to the video automatically.

Almost 38% indicated "other" would be added to the data. Explanations of "other" varied but included five respondents who added officer information, date, and time automatically. Six respondents stated a capability, or intention to seek the capability, to automatically add CAD/RMS information. Two respondents noted a need for CAD integration before this could occur. An additional two respondents specifically mentioned a "lack of true system integration by vendor," which prevented them from adding information automatically. Two respondents mentioned pending decisions based upon vendor selection.

Discussion of Questions of 8-10:

Respondents largely recognize the importance of tagging and annotating metadata and categorizing according to the type of event contained in the footage. However, no consensus regarding the best method or agreement on what those categories should include is currently guiding law enforcement's approach. Definitive decisions about what information to automatically annotate, including basic information such as report numbers or case numbers, are only shared by a handful of agencies. However, multiple means and categories are being applied to single video data segments for tagging and annotation purposes.

How the videos are categorized may have impact on a number of other issues, including storage and retention requirements. They will determine how long they are retained, who has access, and whether – and how – the data will be recalled for use by officials.

Several agencies indicate that they intend to link to an agency's RMS or CAD system for automated tagging and documentation. However, it appears that while some tagging information may be added, the majority of agencies are relying on the officers' ability to correctly tag and code the data manually. Relying on this method leads to possible inconsistency, requires training, and accounts for additional officer time.

QUESTION 11: RMS AUTOMATED INFORMATION

Question 11: ***Does your current Records Management System (RMS) include automated recordings of: (multiple choice answers)?***

A majority of the respondents, 62.32%, said their RMS included automated recordings of dispatch information. Just over 42% said their RMS included automated recordings of 911

calls. Slightly more than 30% said their RMS included automated recordings of non-emergency calls.

Over a third, 36.23%, selected "other" to answer this question. Most of the agencies specified this meant "none of the above" were included as automated recordings into RMS and did not supply an additional explanation. However, a select few did specifically state these automated recordings were part of their CAD system rather than RMS.

Discussion of Question 11:

Automated recordings of certain calls in a RMS or other database may help an agency track and manage call response. In terms of BWC data, the automation may help to ease the burden of reviewing, cataloging and tagging video and assist with program compliance. During an investigation and subsequent prosecution of a suspect, having the call information in a RMS may help to accurately fuse evidence (e.g., BWC footage) and call information into a single source. Understanding RMS capabilities may be an important component in selecting the right BWC vendor. Knowledge of the RMS' functionality is also key to identifying how to integrate BWC data.

Question 11 surveys the extent to which dispatch and call information is integrated into RMS but does not attempt to determine how many agencies intend to integrate BWC video into RMS. This issue is addressed in Question 33, which specifically surveys how many agencies intend to link BWC data to RMS.

QUESTION 12: DATA TRANSFER REQUIREMENTS

Question 12: ***What type of data network currently exists that could support transferring BWC video footage between various remote facilities (e.g. precincts, districts) to the main storage location (e.g. headquarters, data center, cloud provider)?***

Results for this question show that several types of data networks currently exist to transfer BWC video footage between remote facilities to the main storage location. The largest number of respondents, 44.93%, said they have an Ethernet Transport Local Area Network (LAN)/Transparent LAN Service (TLS). Slightly fewer, 42.03%, said they either owned, or leased, an Optical Transport Network (OTN). An Internet Service Provider was used by 23.19% of respondents.

Other data transport networks included microwave for 10.14% and a T-carrier for another 10.14%. Just over 7% of respondents answered "other" to this question, which included, Wi-Fi in the vehicle and a dedicated server for in-vehicle video.

Discussion of Question 12:

There is no consensus on what type of data network is currently available to each agency. A large percentage of the agencies are currently accessing an Ethernet connection, which may have several key advantages in transferring large amounts of data generated by BWCs.
The advantages include the capability of transmitting data at symmetrical speeds while supporting multiple applications, as well as scalable, reliable, low-latency bandwidth needed to drive capacity for video. In implementing BWC programs, each agency must individually assess whether their data needs to transfer BWC video data can be supported by the existing network. Issues for consideration include network speed, bandwidth and network connectivity.

QUESTIONS 13 - 15: IT INFRASTRUCTURE NEEDS

Question 13: ***Will you be required to expand/improve your current IT infrastructure?***

Almost 70% of respondents recognized a need to expand and improve their IT infrastructure to fully support BWCs. Only slightly more than 17% said they did not need to expand or improve their infrastructure. Only 13.04% "did not know" at the time of the survey.

Question 14: ***For your planned system, what will be the amount of bandwidth required?***

For those agencies who responded affirmatively to expanding/improving their infrastructure, the largest group of respondents - nearly 50% - admitted not knowing what amount of bandwidth would be required from their new system.

For those respondents who were able to make a determination, 16.67% anticipated 10 – 100 Gbps. Almost 15% anticipated 1 – 10 Gpbs and 18.75% anticipated 100 Mbps – 1 Gbps. A very small percentage, 2.05%, anticipated 10-100 Mbps.

Question 15: ***What is not adequate at present (multiple choice response options)?***

This question allowed for multiple answers. Of the respondents who said they needed to expand/upgrade their IT infrastructure, more than half, or 54.17%, stated that their current network bandwidth capability was not adequate at present. An additional 45.83% stated that their current storage capacity was not adequate. Wireless capacity was also deemed inadequate, according to just over 27% of agencies. Only 14.58% of agencies responded "don't know" when asked about what part of their IT infrastructure was inadequate.
The remaining 16.67% of agencies responded "other." Additional items mentioned as needing improvement included, "policy and procedures," and inadequate, "electrical wiring and systems," "the city microwave system is not completely built out" and a need for "dedicated power at each station."

Discussion of Questions 13 – 15:

The clear majority of respondents recognize a need to expand and improve their IT infrastructure to fully support BWCs. Specific technology gaps identified include: a lack of data storage capacity, inadequate network or bandwidth capability to transfer data and insufficient wireless capacity. Identifying IT infrastructure gaps and needs for improvement may be one of the most critical steps for law enforcement departments to take in support of BWC program because being able to accurately evaluate what IT network infrastructure is needed will inform decisions regarding vendor selection, data policies, and budgetary needs.

QUESTION 16: UPLOADING VIDEO

Question 16: ***How will you upload the video data?***

The majority, or 65.22%, of the agencies surveyed planned to upload video via a docking station. Wi-Fi or USB will each be used by 7.25% of agencies. Only 2.9% of respondents used a storage card, 4.35% used a 3G/4G network, and only 1.45% used Bluetooth. A small percentage, 5.8%, indicated using another method. Significant in the findings were the just over 30% who had not yet determined how they would upload video data. Two of the respondents commented that this decision was awaiting vendor selection.

Discussion of Question 16:

Uploading and transferring the data from various remote facilities, such as a police vehicle or a district station to a main storage location such as headquarters, a data center or a cloud provider is a critical step in the processing of video. While most agencies are currently using a physical docking station, Wi-Fi and other wireless transmission methods will continue to grow in use as departments move in the direction of incorporating wireless transmission as a core feature in their communications systems (as demonstrated by the increased use of tablets, smart phones and Bluetooth technology). But, regardless of the means of transmission, the quicker and more reliably it can be done, the better it is for officers.

QUESTIONS 17 AND 18: STORAGE

Question 17: ***How will the data be stored in your city/county?***

Almost 45% of respondents stated they chose to store their data via a cloud service provided by a BWC vendor; an additional 7.25% chose a cloud service provide by a non-BWC vendor. Storing data in-house, either on a police/sheriff department's mainframe or server(s), was

the choice of 20.29% of respondents, with an additional 5.8% chose to store their data on a dedicated server(s) at the district or station. Only 5.8% elected to store data on a city or county mainframe server(s). Almost 30% of respondents had "not yet determined" where they would choose to store data. About 3% of respondents chose another form of storage, but declined to specify.

Question 18: ***What is the estimated increase in storage capacity per year (just for BWCs) considering the length of time evidentiary and non-evidentiary video footage must be stored?***

The estimated increase in capacity needed to support the storage of data generated by BWC programs varied widely among agencies. The lowest calculation was an estimated increase of 100 gigabytes (GB) to 1 terabyte (TB) by 7.25% of agencies. Slightly more, 8.7%, estimated the increase to be 1 TB to 10 TBs. Almost, 25% of agencies estimated the increased need to be 10 TBs to 100 TBs. Slightly less than 15% of agencies estimated an increased need above 100 TBs; these findings are significant because they included estimates up to, or exceeding, one petabyte (1PB). (A petabyte (PB) is equivalent to 1,000 terabytes or 1 million gigabytes.)

The single greatest commonality was among the roughly 45% of agencies that "don't know" what the increase in storage capacity will be.

Discussion of Questions 17 and 18:

Questions 17 and 18 both address issues related to the storage capacity needed to support BWC programs. Of specific concern is that storage needs are cumulative, and will increase over time depending on how long the data are stored. Storage needs may vary among agencies depending on policies established for the retention of data (both evidentiary and non-evidentiary) and purging policies related to BWC programs.

This particular set of survey responses does not indicate whether respondents are looking at the impact of data storage over the long term. In order to minimize the amount of digital storage needed, agencies will want to consider policies and practices to purge all videos not specifically needed as evidence in a timely fashion. There are also financial implications to storing vast amounts of data, including the need for contracts for cloud storage, server capacity and improvements to IT infrastructure. The cost of long-term storage in the larger amounts necessary for videos can be staggering but should be accounted for in determining the true costs of a BWC program.

Additionally, security of the data needs to be a priority. While many agencies opt to use internal servers and are therefore responsible for setting up their own safeguards and security measures, a significant number of agencies – 36 in this survey - have chosen to contract for cloud storage and trust third-party vendors with the storage and security of

their very sensitive data. Whether storing video internally or externally, protecting the data and preserving the chain of custody should always be a consideration.

QUESTION 19: VIDEO SHARING

Question 19: ***How will your agency share video data?***

This question allowed for multiple answers. Various methods to share data were chosen by responding agencies. The largest set of respondents, 37.68%, shared video data on an Internet-based portal. Nearly 25% of the respondents shared video data through a law enforcement department network, while 17.39% shared through a city/county jurisdictional network. Over a quarter of the respondents, 27.57%, had "not yet determined" how they will share the data.

Thirteen percent intend to use "other" means to share video data. These methods include burning the information to a DVD, sharing via a secured web link or a "vendor-based sharing ability."

Discussion of Question 19:

Issues related to video sharing include not only how to grant access, but also to whom and for what purposes (issues that are addressed in Question 25 of this survey). Based on the responses, a clear majority of agencies have made an initial decision regarding this particular aspect of their BWC program. In fact, several agencies will use multiple means to share video data.

QUESTION 20: UPLOADING DATA

Question 20: ***How long does it take to completely upload data from each camera unit?***

Almost 38%, the largest group of respondents, determined that it will take less than an hour to completely upload data from each camera unit. An additional 14.49% estimated that it will take anywhere between 1-3 hours to complete the same task. Only a collective total of 8.7% estimated the task will exceed 3 hours. Again, a significant percentage of agency respondents, almost 40%, have "not yet determined" the amount of time uploading data from each camera unit requires.

Discussion of Question 20:

A significant number of respondents have indicated the time necessary to upload data will not exceed one hour. This indicates a fairly minimal time impact on BWC program operations.

However, Question 20 has its limitations on what can be interpreted from the data since it does not specify if only a single day of data or an accumulated total over a longer operational period will be uploaded with each attempt; nor does it differentiate how much data are being uploaded at a given time. Therefore this report is unable to extrapolate enough information to determine whether there is a direct correlation to the number of hours of video captured to the number of hours that is required to upload those data. This makes it difficult to fully assess the impact on operations.

QUESTIONS 21 - 22: DATA RETENTION

Question 21: ***How long will your agency retain Body-Worn Camera video?***

More than 70% of the agencies intended to retain video considered evidence for more than 180 days. Only 6.77% said they retain video data considered evidence for any period less than 180 days.

Responses to retaining videos considered not to be evidence were more equitably distributed. Only 5% stated a need to hold the data for less than 30 days. Just over a tenth of responders, 11.67%, estimated 30-60 days, while 16.67% elected to keep video for 60-90 days and another 15.67% would keep the data for 90-180 days. Just over 31% of respondents estimated that data would be kept for more than 180 days for non-evidentiary cases. Just over 18% responded N/A to the survey question. However, the responses do not clarify why that answer was selected.

Question 22: ***How much data do you anticipate will be uploaded to storage every day, taking into account the average amount of video captured, number of officers wearing cameras per shift and the number of shifts in a 24-hour day?***

Most striking in the numbers are the more than 35% of respondents who "do not know" how much data will need to be uploaded to storage every day. For those respondents who were able to make a determination, 8.7% anticipated 1 – 10 GBs. Just under 25% anticipated 10 – 100 GBs of data and slightly more than 20% anticipated 100 GB to 1 TB of data. Just over 10% anticipated numbers greater than 1 TB of data per day.

Discussion of Questions 21 and 22:

Question 21 breaks the estimate of how long an agency intends to retain BWC video into two categories - evidentiary versus non-evidentiary. There is a distinction quantified in the numbers between the two categories and it is clear from the responses that videos considered evidentiary will require much longer periods of retention.

The large number of responses exceeding 180 days indicate a common understanding that evidence will be kept for extended periods of time. For instance, responses to requirements of retention periods of 180(+) days included two years, three years, and more than 10 years. Whether the tape is to be used as evidence or is involved in an ongoing case means that some data may need to be housed indefinitely. Many agencies point to a statute of limitations and public law rather than internal policy to determine how long to retain video. This indicates that BWC video information is subject to the same requirements as other evidence in any criminal case.

Retention periods for video considered non-evidentiary were less decisive. One agency mentioned a minimum requirement to hold all video for at least one year.

Some respondents were very clear on the length of time they would be holding data, letting state law dictate the parameters of retention. However, others indicated in comments such as "in discussion," "unknown," and "that policy decision has not been made," that supporting policies on video retention were not yet determined. What is clear is that agencies with BWC programs will be making decisions regarding data retention directly related to the rules of evidence and internal policies.

It should be noted that this question was considered "*non-mandatory*" in the survey so it had a lower rate of response than was averaged in other survey questions.

Question 22 helps to demonstrate the increased difficulties in estimating storage needs with so many unknowns, including how much data will be uploaded and stored, and for what period of time. It is of interest to note the distinction between Question 7 and Question 22, both which look at the amount of data generated by BWC. Question 7 focuses on the data generated by an individual officer in a single shift whereas Question 22 looks an aggregate total and takes into account multiple variables, such as the number of officers with BWC cameras, average hours of video captured, the number of shifts uploading during a 24-hour period. Both have relatively high "unknown" responses, 42.03% and 36.23%, respectively.

Questions 21 and 22 are exceedingly important issues since retention policies and the estimated amount of data uploaded each day will drive storage requirements and system capacity needs.

QUESTION 23 - 24: DATA TRANSFER

Question 23: ***On average, how many times do you need to transfer video footage evidence data to/from central data storage repository prior to trial?***

Only 11.59% of respondents estimated that, on average, they needed to transfer video footage only once prior to trial. Just fewer than 15% estimated an average of two to three

times, and just under 9% estimated video footage will require five or more transfers prior to trial. The great majority, 65.22%, "do not know" how many times they will need to transfer data to/from a central data storage repository before trial.

Question 24: ***How does your agency currently plan to transfer video footage?***

Just over 43% of respondents planned to transfer video footage via the cloud, while 24.64% planned do so via a digital file transfer. Transferring video footage via physical means such as a disc, USB thumb drive or a memory card was also significant with 30.43% of agencies that selected this method. Additionally, 7.25% of agencies cited an "other" approach, which included access via a web portal and a wireless upload in a vehicle. The remaining 23.19% indicated the method was undetermined until they received a final product and/or selected a vendor.

Discussion of Questions 23-24:

Question 23 does not ask respondents to provide a reason for why they estimate a need to transfer video to and from a central data repository multiple times; nor does it specify the entities or agencies the footage will need to be transferred between. No additional information was listed for agencies to expand upon, or explain, answers making this question difficult to analyze in more depth. However, the high "don't know" response rate to Question 23 and the relatively significant "don't know" response on Question 24 indicate that many of the technical aspects of video transfer are largely unknown by agencies.

QUESTIONS 25-28: DATA ACCESS AND RELEASE

Questions 25: ***What entities will you allow access to the system for sharing video data?***

This question permitted multiple answers. The answers indicated that most agencies will allow more than one entity access to the system in order to share data. For instance, three quarters of the respondents, just over 75%, granted access to their internal affairs unit. Seventy percent are also granted access to the District Attorney's Office. By comparison, only 44.93% have determined they will allow access by the City Attorney. Allowing access to the Freedom of Information (FOIA) Unit was another large category, with 37.68% of respondents who have granted access. The 13.04% of respondents who specified "other" included the Office of Police Complaints, all internal sections and other agencies for joint cases. Only 15.94% of agencies did not yet know what to what entities they would grant access.

Question 26: ***Will your agency be subject to FOIA release of video?***
An overwhelming majority, 72.46%, stated their agencies are required to provide footage in response to FOIA requests for BWC data, while only 8.7% percent said they are not subject to such requests. Almost 18% "do not know" if they are required to provide footage in response to FOIA requests.

Question 27: ***Will your department redact videos in response to FOIA requests?***
Of those agencies that responded affirmatively to being subject to FOIA release of video the overwhelming number, 78%, determined that they will redact videos; only 4% will not. Eighteen percent listed "not yet determined" or "don't know" as answers.

Question 28: ***What type of equipment will be needed to process videos for court and FOIA?***

This question allowed for multiple answers. Again, of those agencies that responded affirmatively to being subject to FOIA release of video, exactly half, 50%, said they will install software on their computers so they could process videos for FOIA and court requests. By contrast, 16% responded they would do so through a sole-purpose workstation. Six percent would outsource the processing to the vendor. Eight percent stated they would use other methods such as internal video management programs, features provided by vendor and a cloud-based system with enhanced capability to share, redact and download video.

Discussion of Questions 25-28:

The results show that agencies with BWC programs largely understand the importance of being able to share video for internal and criminal investigations, as well as criminal prosecution. However, there was less consistency in the best method to use for sharing that information.

Another category of agreement was the understanding that agencies would be required to provide BWC footage in response to FOIA requests. Fifty of the agencies agreed this would be an issue for BWC programs. Of those, 39 agencies stated the need to redact video in response to those requests. The numbers also indicate that the majority of departments surveyed have already determined what software or equipment they will need to perform this operation; 18 agencies have not yet made a decision.

The issues surrounding the sharing and release of data will continue to be of critical importance as public perception about BWCs' ability to make law enforcement more accountable increases. The public scrutiny and desire for public information driving the deployment of BWCs mean that law enforcement agencies must be prepared to either efficiently and legally comply with requests to release video information or explain why they won't.

Determination of adequate internal policies to support FOIA requests and the release of data is outside the scope of this survey. However, it can be said that agencies should have clear and consistent protocols for sharing data with all entities but especially when releasing video externally to the public and media. Transparency and accountability are important but must be balanced with privacy considerations for the citizens and the officers when determining whether to release the footage. Each agency's internal policies must comply with the state's public disclosure laws, which vary across the nation.

QUESTION 29: PERSONNEL NEEDS

Question 29: ***How many additional personnel will you need to manage and maintain the BWC program?***

The majority of respondents estimated that a slight increase in additional personnel would be required to maintain their BWC program. Just over 36% estimated increases of 1-5 personnel, and just under 25% estimated an increase of 5-10 personnel. A fairly small number of respondents, 5.8%, estimated a larger increase of 10-20 additional personnel and 2.9% estimated an increase in excess of 20 additional personnel. Nearly 19% of agencies did not know what personnel increase would be required to maintain a BWC program.

Discussion of Question 29:

The responses to this question indicate that the vast majority of respondents anticipate the need to increase personnel to manage and maintain their BWC program. However, there is no additional information to indicate exactly what functions or duties will require the additional staff time. There is also no information in the question to determine if the additional staff required will be sworn or non-sworn personnel positions – a differentiation that impacts the overall personnel costs.

QUESTION 30: EMPLOYEE PROFICIENCY

Question 30: ***How proficient are your employees in video editing and processing?***

Nearly 38% of respondents stated that their employees were “not proficient” in video editing and processing and required both basic and advanced training. Just over 26% of respondents qualified their staff as “proficient” and therefore required some additional or refresher training. Only 7.25% of respondents qualified their employees as “very proficient” and in need of no additional training. Just over 13% and just fewer than 16% indicated either “don’t know” or “not applicable,” respectively.

Discussion of Question 30:

Responses demonstrate that agencies will require more training for personnel in order to support BWC programs. A significant percentage, 63.77%, ranked employees as either "proficient" or "non-proficient," thereby recognizing a need for at least some level of additional training (basic, advanced or refresher level) to bring up employee efficiency.

Much of this training will have to be supported by vendors so that officers better understand the technical aspects of using specific equipment and computer programs. However, other aspects of BWC may benefit from assistance from local, state and federal governments to fill training gaps. As the federal government looks for ways to support the implementation of BWC programs at the local law enforcement level, it may choose to fill the training gaps that exist. The ability of personnel to manage and process BWC video impacts all aspects of a BWC program, including its cost effectiveness.

QUESTION 31: COSTS RELATED TO PERSONNEL TRAINING

Question 31: ***How much money/effort do you estimate you will have to spend on training for officers that manage and process BWC video? Please rate on a scale of 1 to 5 (1 =Least, 5 = Most)***

Under a weighted ranking, this question projects the level of money and effort estimated to train officers. Respondents were asked to rate these efforts on a scale from 1(least) to – 5 (most). The vast majority of respondents ranked the effort at a "3" or above. Nineteen of the responding agencies ranked this effort at the highest level of a "5". Seventeen agencies ranked the effort as a "4" level of effort and an additional 17 ranked the needed effort at a "3". Smaller numbers of respondents, four and seven, ranked the effort as fairly low and would require money and effort to train officers at a "1" and "2" respectively.

Discussion of Question 31:

Question 31 estimates the overall anticipated effort and financial support needed to sustain BWC programs without establishing specific dollar amounts or program support. The responses to this question clearly demonstrate that the agencies that are implementing BWC programs see the training of officers as a fairly significant effort. In addition to the initial costs of purchasing cameras and storing data, administering a BWC program requires considerable ongoing financial and staffing commitments. Agencies must provide ongoing training programs for officers, ensure that cameras are properly maintained, and correct any technical issues with equipment. In order to execute BWC programs, police departments will have to establish clear priorities within their budgets and planning to support these programs.

QUESTIONS 32-33: DATA INTEGRATION

QUESTION 32: ***Does your agency already have a digital evidence system?***

A majority of respondents, just over 75%, indicated that their agencies already possessed a digital evidence system. Just over 23% indicated that their agency did not have such a system. Only a single respondent answered "do not know" in response to this question.

Question 33: ***Will your BWC data be integrated with any of the following?***

This question allowed for multiple answers. The results showed that agencies are attempting to integrate BWC data across multiple interrelated digital platforms. While nearly 50% of respondents indicated they had not yet determined if, or how, they will integrate their BWC data, the other half demonstrated a clear intention of integrating data though multiple systems.

For instance, about 29% of respondents sought to integrate BWC data into their existing Records Management System (RMS); 24.64% were looking to integrate BWC data into a Computer-Aided Dispatch (CAD) system. A significantly large group, 37.68%, sought to integrate data into a digital evidence system. Other responses included integrating BWC data into a Closed Circuit Television (CCTV) system and with vehicle dash cameras.

Discussion of Questions 32 – 33:

Although nearly half of the respondents have not yet determined if, or how, they will integrate their BWC data, the responses show that many other agencies are moving forward with their integration efforts. This means that many of agencies deploying Body-Worn Cameras are doing so alongside existing solutions for managing video evidence.

There are both benefits and drawbacks to integrating separate, stand-alone systems. First, there may be technical hurdles to integration. Second, multiple, stand-alone systems can inherently be more costly to deploy and maintain, and also create administrative drawbacks such as working and contracting with individual vendors, and requiring additional staff training to learn various digital programs and interfaces. However, the benefits can include increased system consistency and redundancy, increased efficiency and enhanced data amalgamation.
When integrating multiple systems, agencies must understand their own specific technical needs in order to make their vendor/equipment choice. They also should consider how a particular BWC system will integrate across multiple existing platforms and how it may need to expand over a period of time.

QUESTIONS 34 - 35: POLICIES AND PROCEDURES TO SUPPORT DIGITAL EVIDENCE

Question 34: ***Has your agency developed policies/procedures for your digital evidence system?***

Of those agencies that currently have a digital evidence system, 90.57% said they have developed policies and procedures to support this system. Only 9.43% did not have policies and procedures in place.

Question 35: ***Are your digital evidence protocols (collection, analysis, storage, transfer, etc.) compliant with national forensic standards and guidelines for evidence?***

Of those agencies that currently have a digital evidence system, 62.26% said their digital evidence protocols were compliant with national forensic standards and guidelines. All of the respondents who recognized that they were not in compliance, 13.21%, were working towards becoming so. Just over 24% of respondents were unsure of their compliance status.

Discussion of Questions 34 -35:

The vast majority of respondents have established protocols and procedures for digital evidence management. Question 35 confirms that the few who aren't yet compliant with national standards are working towards establishing compliance. Most troubling might be the nearly quarter of respondents who "don't know" if their digital evidence protocols are compliant with national forensic standards and guidelines.

In moving forward with the implementation BWC programs, it is critical that law enforcement agencies develop the policies and procedures for all aspects of their operations and evidence management. The collection, analysis, storage, and transfer of digital evidence will greatly impact the legal and ethical aspects of BWC programs, including privacy, case management and prosecution. Law enforcement needs clear and definitive standards and guidelines for digital evidence management. Some agencies may greatly benefit from assistance as they develop their policies and procedures regarding BWC programs. Another potential area to surge help is when national and state guidance conflict or are too complex to interpret.

QUESTIONS 36 – 37: VENDOR SELECTION

Question 36: ***What vendors did you or will you include in your pilot?***

Fifty-two agencies responded to this non-mandatory question. The results show that multiple vendors were considered during the pilot program phase and that agencies often tested more than one manufacturer. Seventeen companies were listed as possible options in the

survey with the ability to list others (12 of the companies listed had one or more responses; an additional 3 were specified in the comments section).

TASER, International was the lead vendor selected to participate in 32, or 61.34%, of the agencies' pilot programs. *VIEVU* was another leader; it participated in 27, or 51.92% of the pilot programs.

Wolfcom participated with 9, or 17.31%, of the agencies and *Digital Ally* participated in 8, or 15.38% of pilots. The other vendor participants included *BodyVISION* by L-3 Mobile-Vision, *COBAN Technologies, Inc., Data911, Reveal, Safety Vision,* and VISTA by *WatchGuard Video*. Just over 23% of respondents selected "other" vendors. Those specified included *Panasonic*, which was listed by 4 respondents, *Vidmic* and *Dell/Utility.*

Twenty-five percent of agencies had not yet determined which vendors would be participating in their pilot programs.

Question 37: *What vendor did you or will you make as your final selection?*

Again, 52 agencies responded to this non-mandatory question. The results show that decisions about final vendor selection are almost equally split between those agencies that have selected a vendor, and those that have not. Almost half, 48.08% (or 25 agencies), of respondents had not yet selected a vendor. Just over half, 51.92% (or 27 agencies), had made a selection.

TASER, International was listed as the most common vendor, selected by 32.69% of agencies. *VIEVU* was selected by 7.69% of agencies. *CopTrax from Stalker* (which was not listed as a consideration in any of the pilot programs) was selected by 1.92% of agencies. Of those who selected "other" as their selected vendor, *TASER, International* was under contract with one agency, as was *Panasonic. Wolfcom* and *TASER, International* were the vendor candidates for one respondent's final consideration.

Discussion of Questions 37 - 38:

The results show a relatively select number of BWC vendors being selected for these programs. *TASER, International* and *VIEVU* are the frontrunners, participating in pilot programs and securing the contracts with agencies.

There is no information to explain what information was gained off the pilot to either confirm, or reject, a particular vendor. Nor is there any information about why a particular vendor was selected. This survey does not inform what criteria were driving factors in the selection decision such as camera resolution, system capability, interoperability or data storage options.

Major Cities Chiefs and Major County Sheriffs
Survey of Technology Needs – Body Worn Cameras

QUESTION 38: ADDITIONAL INFORMATION

Question 38: ***Do you face other technology issues and concerns that you wish to add to this survey?***

The final question of the survey asked respondents to add any additional information or concerns they had regarding the technology of BWCs. Thirty-three respondents chose to add additional information.

Discussion of Question 38:

In this section, comments varied across multiple categories but a number of trends emerged in the answers. Some of the responses (such as the need for infrastructure improvements and increased staffing and ability to manage a BWC program) reinforced the information gathered in earlier survey questions. Others (including the cost for purchasing BWC cameras, improvement to camera technology and mounting options for wearable cameras) highlighted new concerns. Many of the comments cross multiple categories. Below is a summary of those comments. *Comments are edited and/or summarized, rather than verbatim, unless otherwise indicated.*

Camera Technology and Capability

- A need for additional wireless capabilities integrated into the cameras themselves (i.e. Wi-Fi, LTE, private broadband).
- Point of View (POV): All BWC would benefit from a national standard in which every video is in the same style format and look. A 90-100 degree POV would be better for most citizen contacts.
- Improvement to the logistics of wearable cameras.
    - Headset cameras too cumbersome
    - A lack of mounting options for uniforms. Provided mounting options work just fine in arid, warm environments, but are not practical in colder climates.

Need for Additional Equipment

- Pairing a BWC with a Bluetooth or Wi-Fi for annotation/comments of recorded video will require a smart device (yet to be issued to every member of the rank and file). This will double equipment costs and or increase operational costs if the device is a cell phone.

Request for Polices, Laws and Guidelines Related to BWC

- A lack of statewide guidelines for BWC use, storage, sharing and technology. Many departments are waiting to implement programs but will not because new state law could cause agencies to revamp current programs and increase costs.

Staffing Increases

- A BWC program would adversely affect business processes, i.e. taking deputies off the street to upload video.
- The impact of FOIA on operations and the need to increase the staff to accommodate growth.
- "It is paramount that agencies with BWC technology dedicate the staff necessary to manage the program. Even with adequate storage, user-friendly software, and a fully integrated CAD/RMS, you must have people to manage the videos that are generated. People are necessary to ensure that all video evidence associated with a criminal prosecution is made available to the prosecution and defense, prepare cases for court, and handle."

Video Management and Storage

- The costs of the required upgrades and storage are going to be significant for law enforcement agencies. For this reason, it may be advisable for the federal government to consider establishing a secure law enforcement cloud server to assist local ongoing efforts. Like the federal systems created for communications, a federal system for digital storage could assist local LE in the proper storage and use of digital evidence.

- For those Departments that have a strong IT unit, local storage/control is not an option as a city/county can't compete with cloud-based companies.
- Data storage and data management are problematic.
- Storage of BWC video evidence will be a significant challenge based on current requirements department requirements.
- The largest issue we faced implementing the program had to do with moving and managing the video. There are several unknowns in the area and, like most cities, we do not have the in-house expertise to build our own management/storage system. This made us totally reliant on the expertise of an outside vendor. As such,
- we ended up with a proprietary system that could become very expensive in the future.
- The cost of storage

Public Expectations

- Communicating to the public the entire technological framework needed to establish a BWC program (i.e. management of video, storage requirements, network effect).
- This technology is somewhat ahead of case law and, as such, is posing some challenges to policy and public expectations.
- The public is not well informed of the technology and therefore assumes BWC can do many things that they cannot. This is a failure to communicate at the state, federal and vendor levels.

Redaction and FOIA Requests

- Another major area of concern is the redaction of open record videos. The creation of automated redaction software would be the ultimate solution though none currently exists.
- Standardization of retention schedules, redaction and public records requirements.
- Speed redaction issues.
- FOIA future costs and resources.

Privacy Concerns

- Filming of juveniles, filming innocent people on calls, filming in hospital setting, filming while deputies are on bathroom breaks.

Cost of Purchasing Devices

- Our biggest hurdle at this point is the cost of purchasing the devices. We have a robust infrastructure with our in-car camera system and would like to integrate BWC's with our current system. That keeps the cost down by only having to purchase additional storage when necessary.

Improvements to IT Infrastructure

- Long-term storage and connectivity (infrastructure) are major concerns.
- Infrastructure improvements will need to be made at several substations as many are still using T1 lines, too slow to send video traffic. If data [are] to be stored off site, with a vendor, we will have to upgrade our outbound Internet pipe to handle over 1 TB per day. If data [are] to be stored in-house, we will need to purchase redundant systems that can store several petabytes.
- Infrastructure grants could assist cities with the connectivity issues that plague many major cities.

Retention and Redaction of Video

- It would be very beneficial for states to pass laws regarding retention and redaction of video.
- Ability to process and redact video on a mass scale to respond to request for information.

Decisions Pending RFP Process

- [Our department] is going through the evaluation of vendor responses obtained as a result of an RFP. Many of the questions in this survey can be answered as soon as a specific vendor is selected.
- Based on the pilot program, we release[d] a request for competitive sealed proposals in early 2015 and are currently in the process of rating and selecting a final solution for our body camera program. The final selection will dictate some of the tech issues we will face, consequently those cannot be listed at this time.

- Our Department's staffing is not ready for a full deployment of BWC. We developed a policy BEFORE we plan[ned] to begin our field test in mid-July. Much of our decision for full deployment will be driven not only on cost, but the current capacity of our IT division. The staff would have to manage/maintain the servers if we use local storage vs. the convenience of a cloud-based system. The cloud system costs, but we're still trying to weigh if it will be worth the cost in the end.

Information Sharing and Regional Coordination

- BWC have not been addressed in a regional sense. In [our] county we are beginning discussions with other agencies, District Attorney, Public Defender and courts to be able to share digital evidence on a shared web-based platform. Currently, each agency is operating independently. More emphasis from organizations like yours would be helpful to push this understanding. Especially the court systems. The courts don't have an understanding of digital evidence storage/sharing and the massive amount coming at the criminal justice system.
- Security for sharing video, especially with public.
- Trying to identify a common platform for sharing digital evidence across the county when all agencies have different systems and providers. Competing policies between agencies when an incident includes response from more than one agency, and each is wearing a camera with a different policy. Mobile platforms in vehicles that allow for WIFI connectivity for uploading video during a shift.

BWC Adoption Concerns

- Despite increased accountability, currently the risk and expense (involving data collection, storage, potential litigation regard editing out or leaving in aspects of digital images) of adoption make the adoption of body worn cameras problematic.
- I welcome the accountability aspects of body worn cameras. Myself and our state association has been lobbying to change the public disclosure statute in order to allow us financially and ethically to adopt their use. Currently the risk and expense (involving data collection, storage, potential litigation regard editing out or leaving in aspects of digital images) of adoption make the adoption of body worn cameras problematic. Our jurisprudence … has not caught up with technology. This is a key challenge / flashpoint for policing over the next several years.

- Most manufacturers are not set to accommodate the size and scope of our Department.

Major Cities Chiefs and Major County Sheriffs
Survey of Technology Needs – Body Worn Cameras

APPENDIX A: RESPONDING AGENCIES

Survey Respondents

The following is a list of the 70 law enforcement agencies that responded to the survey on Body-Worn Camera sponsored by the DHS Office of Emergency Communications, in partnership with the Major Cities Chiefs and Major County Sheriffs.

Alameda County Sheriff's Office
Albuquerque Police Department
Arapahoe County Sheriff's Office
Arlington Police Department
Aurora Colorado Police Department
Austin Police Department
Baltimore County Police Department
Boston Police Department
Charleston County Sheriff's Office
Charlotte Mecklenburg Police
Chicago Police Department
Columbus Police Department
Dallas Police Department
Dane County Sheriff's Office
Douglas County Sheriff's Office
El Paso Police Department
Fairfax County Sheriff's Office
Fort Worth Police Department
Franklin County Sheriff's Office
Fresno Police Department
Fulton County Sheriff's Department
Harris County Sheriff's Office
Houston Police Department
Jefferson County Sheriff's Office
Johnson County Sheriff's Office
Kansas City, Mo Police Department
Las Vegas Metropolitan Police Department
Long Beach Police Department
Los Angeles County Sheriff
Los Angeles Police Department
Louisville Metro Police Department
Mecklenburg County Sheriff's Office
Memphis Police Department
Mesa Police Department
Metropolitan Police Department (D.C)
Miami-Dade Police Department
Milwaukee Police Department
Minneapolis Police Department
Monroe County Sheriff's Office
Montgomery County Police
Montgomery County Sheriff's Office
New Orleans Police Department
New York Police Department
Oakland Police Department
Oklahoma City Police Department
Orange County Sheriff's Department
Orange County Sheriff's Office
Orlando Police Department
Philadelphia Police Department
Phoenix Police Department
Pierce County Sheriff's Department
Pinellas County Sheriff's Office
Pittsburgh Bureau of Police
Portland Police Bureau
Prince George's County Police Department
Sacramento Police Department
Salt Lake City Police Department
San Antonio Police Department
San Bernardino County Sheriff
San Diego Police Department
San Diego Sheriff's Department
San Francisco Police Department
San Jose Police Department
Seattle Police Department
Seminole County Sheriff's Office
Stanislaus County Sheriff's Office
Tampa Police Department
Travis County Sheriff's Office
Tulsa County Sheriff's Office
Wayne County Sheriff's Office

APPENDIX B: SURVEY DOCUMENT

Body Worn Camera Technology Survey

Major Cities Chiefs and Major County Sheriffs: Body Worn Camera Technology Survey

The Major Cities Chiefs and Major County Sheriffs are administering this survey about Body Worn Camera (BWC) systems with support from the DHS Office of Emergency Communications.

The purpose of this survey is to gather data about technical issues surrounding BWC.

Your input will benefit and help shape this effort.

Thank you for your participation.

Note: Please answer each question. If a question or textbox is left blank, the survey will not continue. If you run into any problems, please call Mario Stylianou at 202-525-6421.

Major Cities Chiefs and Major County Sheriffs
Survey of Technology Needs – Body Worn Cameras

Body Worn Camera Technology Survey

Survey Respondent Information

1. Respondent

Name

Law Enforcement Agency Name

Rank/Title

Unit with Agency

Number of Sworn officers

2. Please select your state/province:

3. What is the current status of BWCs in your agency?

- Do not intend to implement BWC program
- Intend to implement but pilot has not yet begun
- In pilot phase
- Completed pilot and are going forward with program
- Completed pilot but not proceeding with program
- Fully operational

Other (please specify)

Major Cities Chiefs and Major County Sheriffs
Survey of Technology Needs – Body Worn Cameras

Body Worn Camera Technology Survey

Technology/Interoperability Issues

4. What is the average number of hours of video captured per officer per day?

5. What video resolution will you require for your BWCs?

- [ ] SD (360/480)
- [ ] HD (720)
- [ ] Full HD (1080)
- [ ] Not yet determined
- [ ] Other (please specify)

6. What is the average quantity of data generated by each officer per day?

- ( ) Less than 1 GB
- ( ) 1 - 5 GB
- ( ) 5 - 10GB
- ( ) More than 10GB
- ( ) Don't know

7. How will officers tag and annotate BWC footage?

- [ ] Directly into the device in the field
- [ ] Pairing a device via Bluetooth in the field
- [ ] Pairing a device via Wi-Fi in the field
- [ ] At the station after the video is uploaded
- [ ] Don't know
- [ ] Other (please specify)

Major Cities Chiefs and Major County Sheriffs
Survey of Technology Needs – Body Worn Cameras

8. What notes and information (metadata) will your officers add to BWC video?

- ☐ Report number
- ☐ Case number
- ☐ Victim's name
- ☐ Suspect's name
- ☐ Not yet determined
- ☐ Other (please specify)

9. Which of these items will be added automatically?

- ☐ Report number
- ☐ Case number
- ☐ Victim's name
- ☐ Suspect's name
- ☐ Not yet determined
- ☐ Other (please specify)

10. Does your current Records Management System (RMS) include automated recordings of:

- ☐ 911 Calls
- ☐ Non-emergency calls
- ☐ Dispatch information
- ☐ Other (please specify)

Major Cities Chiefs and Major County Sheriffs Survey of Technology Needs – Body Worn Cameras

11. What type of data network currently exists that could support transferring BWC video footage between various remote facilities (e.g. precincts, districts) to the main storage location (e.g. headquarters, data center, cloud provider)?

- [ ] Optical Transport Network (owned)
- [ ] Optical Transport Network (leased)
- [ ] Microwave
- [ ] Internet Service Provider
- [ ] T-Carrier
- [ ] Ethernet Transport LAN / Transparent LAN Service (TLS)
- [ ] Don't know
- [ ] Other (please specify)

12. Will you be required to expand/improve your current IT infrastructure?

- ( ) Yes
- ( ) No
- ( ) Don't Know

Major Cities Chiefs and Major County Sheriffs
Survey of Technology Needs – Body Worn Cameras

Body Worn Camera Technology Survey

Required IT Infrastructure Improvements

13. For your planned system, what will be the amount of bandwidth required?

- ○ 10 – 100 Gbps
- ○ 1 – 10 Gbps
- ○ 100 Mbps – 1 Gbps
- ○ 10 – 100s Mbps
- ○ 1 – 10 Mbps
- ○ Don't know
- ○ Other (please specify)

14. What is not adequate at present?

- ☐ Current storage capacity
- ☐ Current network/bandwidth capability
- ☐ Current wireless capacity
- ☐ Don't know
- ☐ Other (please specify)

Major Cities Chiefs and Major County Sheriffs
Survey of Technology Needs – Body Worn Cameras

Body Worn Camera Technology Survey

Data Storage and Management

15. How will you upload the video data?

- [ ] WiFi
- [ ] Bluetooth
- [ ] USB
- [ ] Docking station
- [ ] Storage card
- [ ] 3G/4G Cellular
- [ ] Not yet determined
- [ ] Other (please specify)

16. How will the data be stored in your city/county?

- [ ] City/county mainframe or server(s)
- [ ] Police/Sheriff department mainframe or server(s)
- [ ] Police/Sheriff department districts'/stations' dedicated servers
- [ ] Cloud service provided by BWC vendor
- [ ] Cloud service provided by other vendor
- [ ] Not yet determined
- [ ] Other (please specify)

Major Cities Chiefs and Major County Sheriffs
Survey of Technology Needs – Body Worn Cameras

17. What is the estimated increase in storage capacity per year (just for BWCs) considering the length of time evidence and non-evidence video footage must be stored?

- ○ Less than 100 GB
- ○ 100 GB - 1 TB
- ○ 1 TB - 10 TB
- ○ 10 TB - 100 TB
- ○ 100 TB - 1 PB (Petabyte)
- ○ Greater than 1 PB (Petabyte)
- ○ Don't know
- ○ Other (please specify)

18. How will your agency share video data?

- ☐ Police/Sheriff department network
- ☐ City/County network
- ☐ Internet-based portal
- ☐ Don't know
- ☐ Other (please specify)

19. How long does it take to completely upload data from each camera unit?

- ○ Less than 1 hour
- ○ 1 – 3 hours
- ○ 3 – 5 hours
- ○ 5 – 7 hours
- ○ 7+ hours
- ○ Don't know

20. How long will your agency retain body worn video?

	<30 days	30-60 days	60-90 days	90-180 days	180+ days	N/A
Evidence	○	○	○	○	○	○
Non-evidence	○	○	○	○	○	○

Other (please specify)

Major Cities Chiefs and Major County Sheriffs
Survey of Technology Needs – Body Worn Cameras

21. How much data do you anticipate will be uploaded to storage every day, taking into account the average amount of video captured, number of officers wearing cameras per shift and the number of shifts in a 24-hour day?

- ○ Less than 1 GB
- ○ 1 - 10 GB
- ○ 10 - 100 GB
- ○ 100 GB - 1 TB
- ○ 1 - 10 TB
- ○ Greater than 10 TB
- ○ Don't know

22. On average, how many times do you need to transfer video footage evidence data to/from central data storage repository prior to trial?

- ○ 1
- ○ 2-3
- ○ 4-5
- ○ 5+
- ○ Don't know

23. How does your agency currently or plan to transfer video footage?

- ☐ By digital file transfer
- ☐ By physical media (disc, USB thumb drive, memory card)
- ☐ Via cloud access
- ☐ Don't know
- ☐ Other (please specify)

24. What entities will you allow access to the system for sharing video data?

- ☐ District Attorney
- ☐ City Attorney
- ☐ Internal Affairs
- ☐ FOIA unit
- ☐ Don't know
- ☐ Other (please specify)

25. Will your agency be subject to FOIA release of video?

- ○ Yes
- ○ No
- ○ Don't know

Body Worn Camera Technology Survey

FOIA

26. Will your department redact videos in response to FOIA requests?

- ○ Yes
- ○ No
- ○ Not yet determined
- ○ Don't know

27. What type of equipment will be needed to process videos for court and FOIA?

- ☐ Software installed on pre-existing hardware
- ☐ Purpose built workstation
- ☐ Outsourced to vendor
- ☐ Not yet determined
- ☐ Other (please specify)

Major Cities Chiefs and Major County Sheriffs
Survey of Technology Needs – Body Worn Cameras

Body Worn Camera Technology Survey

Data Storage and Management, Continued

28. How many additional personnel will you need to manage and maintain the BWC program?

- ○ No increase
- ○ 1 to 5
- ○ 5 to 10
- ○ 10 to 20
- ○ More than 20
- ○ Don't know

29. How proficient are your employees in video editing and processing?

- ○ Very proficient – No additional training required
- ○ Proficient – Some additional/refresher training required
- ○ Not proficient – Will require both basic and advanced training
- ○ Not applicable
- ○ Don't know

30. How much money/effort do you estimate you will have to spend on training for officers that manage and process BWC video? Please rate on a scale of 1 to 5 (1 = Least, 5 = Most)

1	2	3	4	5
○	○	○	○	○

31. Does your agency already have a digital evidence system?

- ○ Yes
- ○ No
- ○ Don't know

32. Will your BWC data be integrated with any of the following?

- [ ] Computer-Aided Dispatch (CAD)
- [ ] Records Management System (RMS)
- [ ] Digital Evidence Management System
- [ ] CCTV system
- [ ] Dash cameras
- [ ] Not yet determined
- [ ] Other (please specify)

Body Worn Camera Technology Survey

Digital Evidence System

33. Has your agency developed policies/procedures for your digital evidence system?

- ( ) Yes
- ( ) No
- ( ) Don't know

34. Are your digital evidence protocols (collection, analysis, storage, transfer, etc) compliant with national forensic standards and guidelines for evidence?

- ( ) Yes
- ( ) No, and working towards compliance
- ( ) No, and not working towards compliance
- ( ) Don't know

Major Cities Chiefs and Major County Sheriffs
Survey of Technology Needs – Body Worn Cameras

Body Worn Camera Technology Survey

Vendors

35. What vendors did you or will you include in your pilot?

- [ ] 10-8 Video, LLC
- [ ] BodyVISION by L-3 Mobile-Vision
- [ ] COBAN Technologies, Inc.
- [ ] CopTrax from Stalker
- [ ] Data911
- [ ] Digital Ally, Inc.
- [ ] ONCALL Live Video Streaming
- [ ] PatrolEyes
- [ ] Primal USA
- [ ] Reveal
- [ ] Safety Vision
- [ ] SecGru Systems
- [ ] Tactical Electronics
- [ ] TASER International
- [ ] VIEVU
- [ ] WatchGuard Video
- [ ] Wolfcom
- [ ] Not yet determined
- [ ] Other (please specify)

Major Cities Chiefs and Major County Sheriffs
Survey of Technology Needs – Body Worn Cameras

36. What vendor did you or will you make as your final selection?

- [ ] 10-8 Video, LLC
- [ ] BodyVISION by L-3 Mobile-Vision
- [ ] COBAN Technologies, Inc.
- [ ] CopTrax from Stalker
- [ ] Data911
- [ ] Digital Ally, Inc.
- [ ] ONCALL Live Video Streaming
- [ ] PatrolEyes
- [ ] Primal USA
- [ ] Reveal
- [ ] Safety Vision
- [ ] SecGru Systems
- [ ] Tactical Electronics
- [ ] TASER International
- [ ] VIEVU
- [ ] WatchGuard Video
- [ ] Wolfcom
- [ ] Not yet determined
- [ ] Other (please specify)

Major Cities Chiefs and Major County Sheriffs
Survey of Technology Needs – Body Worn Cameras

Body Worn Camera Technology Survey

Comments

37. Do you face other technology issues and concerns that you wish to add to this survey?