

**BODY WORN CAMERAS IN POLICING: THE VALUE AND COSTS OF  
IMPLEMENTATION IN CANADA**

By

Shaun Wright

MAJOR PAPER SUBMITTED IN PARTIAL  
FULFILLMENT OF  
THE REQUIREMENTS FOR THE DEGREE OF

MASTER OF ARTS  
IN  
CRIMINAL JUSTICE

In the School of Criminology and Criminal Justice

© Shaun Wright, 2017

UNIVERSITY OF THE FRASER VALLEY

Winter 2017

All rights reserved. This work may not be  
reproduced in whole or in part, by photocopy  
or other means, without permission of the author.

## **Approval**

**Name:** Shaun Wright

**Degree:** Masters of Arts in Criminal Justice

**Title:** BODY WORN CAMERAS IN POLICING: THE VALUE AND COSTS OF  
IMPLEMENTATION IN CANADA

## **Examining Committee**

**Dr. Amy Prevost, Examining Committee Chair**

**GPC Chair**

Director, School of Criminology and Criminal Justice

---

**Dr. Amanda McCormick**

Senior Supervisor

Associate Professor, School of Criminology and Criminal Justice

---

**Bob Rich**

Chief Constable

Abbotsford Police Department

**Date Defended/Approved:** April 27, 2017

**University of the Fraser Valley**  
**Declaration of Partial Copyright Licence**

The author, whose copyright is declared on the title page of this work, has granted to the University of the Fraser Valley the right to lend this major paper or project, or graduate thesis to users of the University of the Fraser Valley Library, and to make partial or single copies only for such users or in response to a request from the library of any other university, or other educational institution, on its own behalf or for one of its users.

The author has further granted permission to the University of the Fraser Valley to keep or make a digital copy for use in its circulating collection, and, without changing the content, to translate the major paper or project, or graduate thesis, if technically possible, to any medium or format for the purpose or preservation of the digital work.

The author has further agreed that permission for multiple copying of this work for scholarly purposes may be granted by either the author or the Associate Vice-President, Research, Engagement and Graduate Studies.

It is understood that copying or publication of this work for financial gain shall not be allowed without the author's written permission.

Permission for public performance, or limited permission for private scholarly use, of any multimedia materials forming part of this work, may have been granted by the author. This information may be found on the separately catalogued multimedia material and in the signed Partial Copyright Licence.

The original Partial Copyright Licence attesting to these terms, and signed by this author, may be found at the University of the Fraser Valley Library.

University of the Fraser Valley  
Abbotsford, B.C.

## **Abstract**

The use of body worn cameras in policing has received increased interest following a number of high profile incidents in the USA since 2014. Body worn cameras have been touted as a tool to increase transparency and hold police more accountable during interactions with vulnerable sectors of the population. Political pressure and public opinion have encouraged police agencies in Canada to explore the use of these devices, despite the fact that they operate in a political and social climate that differs from that of the United States. An analysis of the effects of body worn cameras on police and public interactions, the capabilities of current body worn camera devices, concerns related to video surveillance by the police and the subsequent effect on privacy rights of individuals, and financial costs show many challenges and questionable benefit from the widespread use of body worn cameras by police particularly in the Canadian context

## Contents

Abstract .....	iv
Introduction.....	1
Body Worn Cameras.....	3
Public Confidence.....	5
Public Complaints.....	13
Value of BWC Evidence.....	17
Officer Performance and Training .....	20
Privacy Concerns .....	21
Technological Limitations .....	26
The Financial Costs of a BWC Program.....	33
Conclusion .....	37
References.....	41

## **Introduction**

It is indisputable that rapidly changing technology affects nearly every aspect of modern life. This has been the case in the realm of modern policing. The last thirty years has seen the widespread implementation of technology in many aspects of policing. This has included many technological advancements that have been adopted across North America, such as in-car computers, GPS tracking, DNA analysis, and digital communications. These advancements have assisted police in increasing efficiency, gathering evidence, and increasing their overall effectiveness. Prior to the implementation of each of these technologies, police agencies had to evaluate the costs and weigh them against the benefits the new technology would provide.

Many police agencies are currently evaluating new technological innovations to further enhance their ability to provide effective policing. One of these that has received a considerable amount of discussion and media attention over the last few years is the use of body worn cameras (BWCs) by police officers. Much of the discussion and support for widespread implementation of BWCs came as a result of media and political discussions in the wake of significant social protest in the United States. The wave of protests was sparked by several police use of force incidents that resulted in the death of minority suspects, such as in Ferguson, Missouri in 2014, as well as several other major cities during the next year (Yan & Almasy, 2014; Davey & Bosman, 2014; Mueller & Southall, 2014). The introduction of BWCs was often presented as a quick fix to fractured police-community relations and presented an opportunity for political officials to both quickly and demonstrably take action in relation to this issue. As a result, many police agencies quickly moved to implement widespread BWC programs across the United States, with 42 of 68 “major city” police departments adopting their use within two years

(Sanchez, 2016). Axon, a division of Taser International, is one of several large manufacturers of BWC devices. A press release on the Taser website announced publically that as of March 2016, over 3,500 of the approximately 18,000 police agencies in the United States had purchased their BWCs. It also announced that in the six month period prior to March 2017, the company had sold over 2,500 BWC devices in nine significant orders alone (Taser International). The rapid proliferation of this technology in the United States has had an effect beyond the borders of that country and the discussion of BWCs in policing became a subject of examination by the public, politicians and police agencies across Canada as well.

The discussion about, and analysis of, the use of BWCs in policing has identified a number of perceived benefits. The most publically discussed of those is increasing public confidence in police through increased accountability of police officers. BWCs are perceived by many as a method to reduce undesirable behaviours by police officers, particularly in relation to visible minority suspects. BWCs have also been touted as a method to not only protect the public, but to also protect police by discouraging or refuting unfounded or vexatious complaints against them. Other perceived benefits of BWCs are the gathering of best evidence from in progress events without the influence of subjective perceptions or bias. There are also potential benefits from using BWCs to aid in the training and professional development of police officers.

Still, the implementation and use of BWCs in policing introduces several significant challenges. Widespread video recording by police, the use, and dissemination of those recordings raises concerns with regard to privacy rights of individuals. The cost of implementing a comprehensive BWC program is a significant financial investment for any police agency or associated level of government. The ongoing costs to maintain that program will also be substantial. BWCs are only as effective as the current technology and current BWC platforms

have limitations that may prevent them from providing the quality of results that were anticipated when programs were implemented. In addition to financial costs for BWC equipment, there is a human resource cost associated to time required for training and ongoing administration of a BWC program that potentially reduces the efficiency of front line officers.

This paper examines the potential benefits and challenges associated with BWC programs in police agencies. The use of BWC programs in the United States, United Kingdom, and Canada will be reviewed. The purpose is to determine if widespread implementation of BWC is both practical and warranted in Canadian police agencies at this time.

### **Body Worn Cameras**

Body worn cameras come in a considerable number of physical designs, ranging from rectangular devices intended to be worn on the chest, to devices the shape and size of a small flashlight that are worn on a headband or clip onto the officer's clothing. The array of devices available also provide a range of capabilities. However, they are all primarily designed to accomplish the core function of constantly being carried by an individual for the purpose of recording events. A report on different BWC devices available for purchase defined BWCs as "cameras with at least one microphone and internal data storage, and [which] allow audio/video footage to be stored and analyzed with compatible software. The cameras are typically located on the police officer's chest or head" (Hung, Babin & Coberly, 2016, p.1-9). In considering the deployment of BWCs, a police agency must first select from the many types of BWC devices available, but also the policy that officers within that agency will follow when using them.

The United Kingdom adopted the use of BWC prior to most other countries. The UK Home Office provides national direction to police agencies, including a document regarding BWC use, *Guidance for the Police Use of Body-Worn Video Devices (2007)*. Direction is



provided that officers should not indiscriminately record throughout their entire shifts but should use the BWC to record specific incidents. The officers have the discretion when to record but are responsible for justifying why they chose not to record an incident. Officers are to treat all recordings as if they are evidence. Officers are encouraged to begin recording with regard to an incident as early as possible, including prior to arriving at an incident if possible. Officers should make a verbal announcement that the BWC is actively recording. Officers are also directed that once a recording is initiated, they must continue recording until the conclusion of the incident. Direction is provided to officers that certain situations must not be recorded such as any circumstances where person are in a state of undress and where legal privilege exists. They are also advised to limit the use of video in private dwellings during domestic violence incidents to only what is necessary as evidence for the case.

While not binding, the International Association of Chiefs of Police (IACP) drafted a model policy in 2014 to act as a framework for agencies implementing a BWC program. Similar to the direction provided in the UK, officers are provided the guidance on when to activate the BWC but are informed that they should continue recording after the device is activated until the incident is concluded. It also similarly speaks to restricting use of the BWC in situation where individuals have a heightened expectation of privacy (IACP, 2014).

These principles of officer discretion in the use of the BWC devices are represented in the BWC policies of several North American police agencies such as Calgary, Edmonton, Toronto, and Seattle (Calgary Police Service, 2015; Edmonton Police Service, 2015; Toronto Police Service, 2016; Seattle Police Department, 2016). While many Canadian police services have conducted pilot projects to study the feasibility of BWCs, only Calgary and Toronto announced plans to implement full programs, equipping all uniformed officers (Platt, 2016;

Janus, 2016). Yes, less than a year after beginning the implementation of a full scale BWC program, Calgary suspended the program due to issue of unreliability with the BWC devices (Platt, 2016).

### **Public Confidence**

Police are provided with lawful authority to use force against individuals in certain circumstances. Section 25 of the Criminal Code provides authority for peace officers to use as much force as is necessary in order to fulfill their duties in the enforcement of the law if they are acting on reasonable grounds. Force used by police when an individual is not resisting, force that continues after an individual stops resisting, and the use of greater force than required to gain compliance from an individual are generally considered to be examples of excessive force beyond the authority provided to police by law (Boivin & Lagace, 2016). The use of force by police in Canada is a relatively infrequent event. A study of the Calgary Police Service defined “police use of force” as any use of force above the level of handcuffing or low-level pain compliance. The study found that 1.5 percent of all arrests involved a police use of force (Butler & Hall, 2008). The use of force that was used in those incidents included physical control, pepper spray, baton, conducted energy weapon, and carotid control. While no incidents of firearm use were recorded in the study, such incidents would also be considered a police use of force. Arrests make up only a small proportion of interactions between police and members of the public. A study of police use of force in four Canadian cities showed that 99.9 percent of police and public interactions do not involve police use of force (Hall, Votova & Wood, 2013). When police use of force does occur, it is primarily when dealing with persons who are intoxicated or emotionally disturbed.

One of the cornerstones of policing in western democratic countries is the concept of trust between the police and the community. This sense of trust is a fundamental foundation of the model developed by Sir Robert Peel (Stocker, Kocher, & Gritz, 2015). However, one major criminological theory questions the validity of this preconceived level of trust. The premise of Social Conflict Theory is that certain groups in society are dominated by individuals and groups with greater power. This results in unequal opportunities, experiences and punishments for different members of society, depending upon which group they belong to (Peak & Everitt, 2017). This theory assists in explaining both the incidents of violent, and sometimes deadly, interactions between police and minority men, as well as the wave of protests that occurred after those incidents. Peak and Everett argue that “for many who are downtrodden, the police symbolize brutality because the officers represent the majority group’s law which serves to keep the minority groups in their place” (2017, p.172). With large segments of society potentially viewing police as oppressors whose purpose is to repress them and further the agenda of the upper-class, it is difficult for police agencies to gain and maintain the trust of all citizens. There must be a mechanism in place that those individuals perceive as holding the police accountable and limiting their ability to take action against disadvantaged groups within society if there is any reasonable chance that they will begin to trust the motives and actions of police.

Regardless of whether the use of BWCs by police is an effective tool for building trust with disadvantaged segments of society, it may be seen as an effective tool in reducing violent conflict between police and citizens. Elements of Deterrence Theory can be observed throughout modern western criminal justice systems. Deterrence Theory holds that punishment for criminal acts may be used not to simply seek retribution or restitution for the criminal act but also to deter future criminal acts. This deterrence may be in the form of specific deterrence to discourage that

specific offender from committing another crime, or the form of general deterrence where the punishment of an offender discourages others from committing similar acts (. In deterrence theory, individuals are seen as rational actors, and in order to be effective, the punishment for a crime must outweigh the benefit the offender perceives in committing the criminal act (Carlsmith & Darley, 2002). This is the basis for more severe penalties being associated with more serious crimes. For example, in Canada, murder is punishable by life imprisonment, while lesser crimes such as shoplifting are typically subject to minor sanctions such as fines or probation. Still, while the use of harsh punishment such as imprisonment is commonly thought to be a deterrent to future criminal acts, imprisonment has not been effective in reducing criminal activity (Nagin, Cullen, & Johnson, 2009).

BWCs touch on several elements of these criminological theories. Regarding Social Conflict Theory where the police are viewed as oppressors against the powerless, the widespread use of BWCs by police may be effective in reducing the use of unwarranted physical force against citizens. Having the interaction of police and citizens recorded would significantly increase the likelihood that such corrupt behaviour by police would be identified. Perhaps more importantly, it would increase the certainty that the police officer involved would face punishment as video evidence would exist in addition to only the accounts of events from the officer and alleged victim. Likewise, individuals who may be inclined to assault or physically resist police may be deterred by the presence of a BWC that will record their actions and clearly show their behaviour thereby increasing the chance they will be convicted. It has been observed that the certainty of punishment is more consistent in deterring crime than the severity of the punishment imposed (Nagin & Pogarsky, 2001). Building upon this premise, the widespread use of BWCs may modify the attitude and behaviour of police and citizens when interacting beyond

simply preventing physical altercations. Knowing that they are being video recorded may encourage individuals to act in a more courteous and less confrontational manner, in order to be viewed in a more favourable manner when the video is reviewed by others, such as a judge, or the general public if the video is released to the media. In addition to enhancing how those individuals would be perceived, it may reduce friction and animosity between police and the individual during that interaction, thus preventing what may have otherwise been an escalation that would have resulted in a violent confrontation.

The use of BWCs is a tool that may assist in building this trust, or at least mitigating some of the mistrust that exists due to a social power imbalance between certain groups in society. BWCs provide an opportunity to record the actions of police during interactions with vulnerable individuals in society. Without BWCs, these interactions are often witnessed only by the police and the individual involved, providing no definitive account of the events. If there is police misconduct during such interactions, the repressed individual does not possess the power to hold the police to account as the powerful will protect their own interests, which includes protecting the police who are used to further their agenda. In the worst case scenario, when the individual is killed during the interaction, only the account of the police officer may be available to describe the events and context in which they occurred. BWCs may provide a method of restricting the ability of police officers to act with impunity, or reduce the perception of disadvantaged groups that they are acting in such a manner.

Several incidents that have occurred in North America over the last several years have brought about significant mass media attention of those incidents specifically, as well as the lack of confidence in police more generally from some segments of the public. The majority of these incidents have occurred in the United States, but there have been similar incidents which have

occurred in Canada as well, such as the death of Robert Dziekanski at the Vancouver International Airport and the shooting of Sammy Yatim in Toronto (Keller, 2015; Rogan, 2014). Police use of force incidents in major metropolitan areas in the United States, such as Ferguson, New York City, and Baltimore that resulted in the deaths of black men received national, and international, media coverage. They also resulted in the level of trust between the community and police being strained, prompting calls for the United States Justice Department to investigate the standard of police conduct in those situations (Stocker et al, 2015). An annual Gallup poll has shown that between 1993 and 2016 American confidence in police has varied between 52 percent and 59 percent each year, with the exception of 2004 when it was reported at 64 percent (Newport, 2016). Yet while the United States has experienced poor levels of public confidence in police, there remains a high level of public confidence in police in Canada. Studies conducted in several British Columbia municipalities show high levels of satisfaction with police, even after highly publicized incidents such as the deaths of Robert Dziekanski and Sammy Yatim, as well as the civil unrest in the United States. In 2014, a study showed that 77 percent of a random sample of Surrey residents were satisfied with the Surrey Royal Canadian Mounted Police (RCMP) (Cohen, Davies, & McCormick, 2015). Even higher satisfaction rates were observed in other municipalities. In 2009, 86 percent of respondents stated they were satisfied with the Burnaby RCMP and that same year residents of Chilliwack, Agassiz, Hope, and Boston Bar reported an 88 percent satisfaction rate with the Upper Fraser Valley Regional Detachment RCMP (Cohen, Plecas & McCormick, 2009a; Cohen, Plecas & McCormick, 2009b). After two years of media coverage of conflict between the public and police in the United States following the police shooting in Ferguson, a similar study in 2016 showed an 88 percent satisfaction rate with police in West Vancouver (Cohen & McCormick, 2016). A 2015 report released by

Statistics Canada on public confidence in Canadian institutions also showed a high level of public confidence for police in Canada at 75 percent, higher than any of the other institutions listed, including schools, banks, courts, media, parliament, and major corporations (Cotter, 2015).

Police agencies, particularly in the United States, are facing considerable external pressure to implement BWC programs based upon the assumption that BWCs will improve transparency and increase trust with the public (Sousa, Coldren, Rodriguez & Braga, 2016). The opinion that BWCs will improve the transparency of police operations and increase the trust of the public is shared by a wide range of interested parties. BWCs have only been used in policing in North America for a short period of time and little is known about the potential long-term outcomes from their widespread use. Despite this uncertainty, both civil rights activists and some police leaders have expressed optimism that BWCs have the potential to improve transparency in policing (Mateescu, Rosenblat & Boyd, 2015). The use of BWCs by police is supported by the American Civil Liberties Union due to the benefit it would provide in monitoring the use of force and arrest powers by police (Stanley, 2015). In February 2015, the Bureau of Justice Assistance convened a BWC expert panel including law enforcement leaders and various other stakeholders who developed a toolkit, guidance, and model policy for United States police agencies implementing a BWC program. The inclusion of community, privacy and victim advocates in the process was intended, in part, to ensure transparency in policing (President's Task Force on 21<sup>st</sup> Century Policing, 2015).

Police officers hold a position of considerable power in society. They are empowered to arrest persons and deprive them of their personal liberties. They are also authorized by law, and expected by society, to use physical force against other persons in certain situations. Police

leaders must ensure the accountability of police officers within their respective organizations. Being accountable means that corruption and inappropriate behaviours, including misuse of force, failing to apply the law due to personal interests, and discrimination against particular persons or groups must not be permitted (Kelling, Wasserman & Williams, 1988). Police officers can be held to account for inappropriate behaviour through statutory investigations for criminal wrongdoing, the same as any other citizen. They can also be held accountable for non-criminal actions through code of conduct investigations authorized by the governing legislation in that jurisdiction. Police leaders have to rely on complaints from the public and limited evidence documenting police and public interactions, dealing often with only the account of the two parties involved. One of the primary motivations for the adoption of BWCs in many countries is that it would provide independent evidence of police and public interaction, making it easier to hold police accountable for actions beyond their legal authority that they commit against members of the public (Coudert, Butin, & Métayer, 2015).

Politicians have identified the use of BWCs by police as a way in which they can publically take action to build trust between police and the community. In 2015, the United States Department of Justice (USDOJ) announced a BWC pilot program that included over US\$23 million to purchase 50,000 BWCs for use by police agencies. The funding announcement published by the US DOJ stated that it was a “part of President Obama’s commitment to building trust and transparency between law enforcement and the communities they serve” (2015, p. 1). The sentiments of the President continue to be echoed by local politicians who support BWC as a method of smoothing conflict between their community and the police. After the Seattle Police Department rolled out a limited deployment of BWC devices to the bicycle officers of West Precinct in January, 2017 as part of a phased implementation plan



to deploy BWC devices to officers across the city, Mayor Ed Murray stated that deploying the cameras on officers was a move toward increased transparency and accountability (Office of the Mayor Edward B. Murray, 2017).

Judicial decisions and inquiries have also touched on the issue of the importance of establishing a strong concept of transparency in policing. This was evident in the *Floyd v. City of New York* ruling against the New York Police Department's stop, question, and frisk program. In her decision on this matter, Judge Scheindlin wrote:

Video recordings will serve a variety of useful functions. *First* [Emphasis in original], they will provide a contemporaneous, objective record of stops and frisks, allowing for the review of officer conduct by supervisors and the courts. The recordings may either confirm or refute the belief of some minorities that they have been stopped simply as a result of their race, or based on the clothes they wore, such as baggy pants or a hoodie. (2013, p.26)

Similarly, in 2014, the Honourable Frank Iacobucci produced an independent report on the use of lethal force by Toronto Police Service (TPS) that had been initiated at the request of the TPS chief of police. In the report, Iacobucci made 84 recommendations to the TPS. Several of those recommendations made reference to increasing accountability and transparency. To that end, recommendation #72 was that the TPS should issue BWCs to all officers who may deal with people in crisis, such as the mentally ill or other marginalized segments of society (Iacobucci, 2014).

Yet the strong support from various segments of society for BWC as a tool to increase police accountability to reduce improper use of force may not be justified. There has been limited study in this area, but an analysis conducted of ten studies of BWC programs in multiple countries provides a fuller picture than the individual studies, some of which were quite limited in scope (Ariel, Sutherland, Henstrock et al., 2016a). Some of the studies examined showed a reduction in the use of force by police, while others showed an increase. The analysis found that

police use of force rates were seen to increase when officers wearing BWCs were given broad discretion when the devices were activated. Conversely, when officers were held to a strict protocol on BWC activation, use of force rates decreased. The study does not identify the cause of this correlation between discretion in use of the BWC and the frequency of police using force. However, this may be due to the fact that when officers are recording more of their interactions with the public, they feel pressure to resolve conflict through methods other than physical force, even when it may be legally justified, and may be more inclined to avoid escalating situations. The authors of the analysis suggested that as a result of these findings, if a true increase in police accountability is to occur, BWC policies should record throughout an officer's entire shift with verbal reminders being provided by the officers to citizens that the BWC is present and recording (Ariel et al., 2016a).

### **Public Complaints**

Politicians and community advocates have sometimes been vocal in their view that the public does not trust the police and that police behaviour is often inappropriate, resulting in public complaints. These complaints commonly relate to undesirable behaviours of officers, including neglect of duty, improper attitude, oppressive conduct, and use of force (Plecas, Armstrong, Tassone, Cohen & McCormick, 2010). While the inappropriate actions of police may generate public complaints, they are not always justified and may be frivolous or vexatious in nature. A study of complaints against the RCMP in British Columbia over a fifteen year period showed that there was an average of 805 complaints each year. Of those complaints, 47 percent were not substantiated at the end of an investigation (Plecas et al., 2010). The concept of reducing public complaints, either through improved officer behaviour or discouraging baseless complaints, is desirable to police agencies who are required to dedicate resources to investigate

and resolve those complaints. This issue is significant enough that it has been listed as a consideration in several BWC pilot projects conducted in Canada over the last decade. For instance, the Victoria Police Department ran one of the first BWC pilot projects in Canada in 2009. The small pilot listed a reduction in public complaints as an objective (Victoria Police Department, 2009). Similarly, the 2015 report from the Edmonton Police Service (EPS) on a BWC pilot project that had been conducted listed the reduction of complaints against police officers as a goal of the project (EPS, 2015).

The idea that complaints may be reduced is not held exclusively by police executives but is also held by many front line police officers. A study involving patrol officers in Orlando, Florida demonstrated an attitude of widespread acceptance of BWC technology. 77 percent of police officers advised that they felt comfortable wearing BWCs, with 30 percent stating they believed external complaints from the public would be reduced, and 27 percent stating that they believed the number of internal complaints from employees within the organization would also be reduced (Jennings, Fridell & Lynch, 2014). It is apparent that many police officers believe that BWCs have the potential to reduce complaints against them, either through modifying officer behaviour or preventing unfounded complaints from the public.

Some studies have supported the hypothesis that police agencies using BWCs may experience lower rates of public complaints. In a year-long study on the Isle of Wight in the UK, it was found that a test group of officers who wore BWCs received fifteen percent fewer minor public complaints and eleven and a half percent fewer significant public complaints compared to the previous year. This is in contrast to a control group of police officers who during the same time period experienced a five percent decline in minor complaints and a nearly seven percent increase in significant public complaints (Ellis, Jenkins, & Smith, 2015). In Rialto, California, a

study over the course of a year found that the volume of public complaints against police officers wearing BWCs was less than thirteen percent of the volume received the previous year. While police officers had approximately four percent fewer contacts with the public during the experimental period, the drop in public complaints observed was significant (Ariel, Farrar, & Sutherland, 2015). This finding is consistent with some other experiences in the United States. A fifteen month test period in Phoenix, Arizona, found that police officers who were in the test group using BWCs experienced a 22.5 percent reduction in complaints against them from the public compared to a 10.6 percent increase against officers in a comparison group (Katz, Choate, Ready, & Nuño, 2014). A year-long evaluation of BWCs in the neighbouring municipality of Mesa also showed a significant reduction in public complaints. Officers assigned to wear BWCs received 40 percent fewer public complaints compared to the previous one year period (Mesa Police Department, 2013). A similar year-long study in Orlando, Florida also found that officers wearing BWCs experienced a reduction in complaints from the public of nearly nine percent (Jennings et al, 2015). These studies that did report the reduction of public complaints against officers wearing BWCs did not determine if the change was the result of previously undesirable behaviour by the police improving or unfounded and vexatious complaints from the public being deterred.

Yet, not all studies have shown that BWCs reduce the number of complaints against police. A 2011 report issued on the results of two Scottish evaluations of BWCs in Aberdeen and Renfrewshire found that no evidence had been produced that supported the belief that BWC use reduced complaints from the public against the police (ODS Consulting, 2011). The EPS found that during their BWC pilot project there was “no quantitative evidence that [BWCs] had an impact on the number of complaints made” (EPS, 2015, p.55). In fact, to the contrary, the

TPS found during their BWC pilot project that the rate public complaints against officers wearing BWCs actually increased to double the pre-pilot complaint rate (TPS, 2016). The conflicting findings involving observations of large percentage changes in public complaints may be due to the fact that the numbers of public complaints are very low. During the ten month TPS BWC pilot project, the rate of public complaints appears to have increased substantially however, the total number of complaints received against the officers during that period was only five, compared to three received during the same length of time prior to the study (TPS, 2016).

In addition to potentially reducing the number of public complaints against police, the presence of a video recording device such as a BWC may assist police agencies in resolving those complaints that are made by dissatisfied members of the public in a timely manner as well as supporting police officers against false complaints made by members of the public. In this regard, in 2004, the IACP conducted a study for the USDOJ on the effect of video evidence on policing. The study was conducted through surveys completed by various stakeholder groups. The study found that 93 percent of public complaints were not sustained against police officers when video evidence of the interaction was available. The study also concluded that a significant amount of time was saved in investigating public complaints against police officers when video evidence was available (IACP, 2004). Similarly, a Scottish evaluation on BWC in Aberdeen and Renfrewshire found that all seven public complaints received during the evaluation period were determined to be unfounded due to the assistance of video evidence (ODS Consulting, 2011). The evaluation also stated that “the amount of police time that is required to deal with any complaints received is often less when [BWC] is worn” (p.14). The results of the TPS BWC pilot project confirmed the speedier resolution of public complaints as

well with the average number of days for those investigations decreasing by eighteen percent compared to the pre-pilot period (TPS, 2016).

While some early research has shown that BWCs may reduce public complaints against police, that does not necessarily mean that their adoption will reduce the number of violent interactions between police and the public (Ariel et al., 2016b). The analysis of data from ten BWC studies from multiple countries, involving over two million officer-hours, provides a more comprehensive understanding of the effects of BWC use in policing than the smaller individual studies. The analysis found that the results of BWC use in different jurisdictions produced widely varying results with regard to violent interactions between the police and the public. While the results varied significantly between the individual studies, the analysis provided two conclusions regarding violent interactions between the police and the public. The first is that BWC use does not have an overall discernible effect on the rate of police use of force. The second is that officers wearing BWCs report more incidents of being assaulted during their shift (Ariel et al., 2016b). The cause of this increase is not known. It may be attributable to a number of factors, such as officers being less assertive due to the monitoring effect of the BWC making them more vulnerable to assault or the presence of the BWC and available video evidence prompting higher reporting rates among those officers who are assaulted (Ariel et al., 2016b).

### **Value of BWC Evidence**

BWCs have received considerable attention in recent years as a tool to monitor police and public behaviour and provide an ability to review interactions to increase accountability and build trust. BWCs also presents an opportunity for police to effectively collect high quality evidence of crimes and other incidents. With the proliferation of smartphones in society, it is commonplace for incidents of interest, including those involving the police in conflict with an

individual, to be video recorded. Recordings of significant incidents are often widely distributed over social media or provided to traditional media outlets where they are in turn broadcast to a wide audience. These citizen recorded videos often begin after the incident has been initiated and may serve to undermine the accounts of the police officers involved as it may not properly represent the incident as perceived by them (Coudert et al., 2015). BWCs have the potential to provide an account of incidents more closely aligned to the perceptions of the police officers involved. The video recorded is much nearer from the perspective of the police officer, providing a more accurate representation of what they may have perceived during the incident as well as their actions and involvement. BWC recordings could therefore allow judges, juries, and others to better understand the perceptions and judgements of a police officer during an incident, be it a use of force confrontation or simply the gathering of evidence during an investigation. Many BWC devices make use of buffering technology. This technology involves constant recording which is only retained for a short period of time unless the user manually activates the recording function. This auto-buffering ensures that the period prior to activation is included in the recorded video as well (Coudert et al., 2015). This capability provides a more fulsome account of an incident when compared to video taken by the public, which rarely captures the initial interactions of an incident.

In addition to use of force incidents, BWC video may provide benefits during other investigations. There has been some study on the effect of BWC video in the investigation and prosecution of domestic violence incidents. One study conducted in Essex in the United Kingdom showed that the use of BWCs may have the potential to increase the proportion of domestic violence investigations that result in charges, although they did not examine the final outcomes of those cases in court. It also found that investigating officers felt the BWC video

was more effective in conveying the context of the situation than a witness statement alone (Owens, Mann, & Mckenna, 2014). However, the authors caution against the generalization of the results as it was limited in scope and BWCs were not utilized at all domestic violence calls during the observation period. Another study in Phoenix also found that officers using BWCs were more likely to make an arrest at a domestic violence incident. It also found that there was an increase in charges and guilty pleas in those cases (Morrow, Katz & Choate, 2016). Both of these studies show there are potentially limited benefits in evidence gathering in relation to domestic violence investigations. Still, these results may not be applicable to Canada as cultural attitudes and police procedures in relation to domestic violence may vary significantly between international jurisdictions. Further, the findings from the TPS BWC pilot project evaluation also found that BWC video may provide some benefit in providing evidence, but less so than the initial expectations held by officers before using the devices. Crown prosecutors were of the opinion that BWC video evidence may potentially assist in early resolution of some cases; however, three factors were noted during the study period that limited the value of BWC video. These included the fact that BWC video largely recorded the reporting of the incident, not the actual incident itself, Crown staff spent hours reviewing BWC video that provided little, if any benefit, and the disclosure of BWC video tended to occur after the first appearance of the accused, which is when Crown felt it would have been most useful (TPS, 2016).

Results from several studies in the UK indicate that BWC video evidence has the potential to reduce the amount of time police officers spend on paperwork and increase the likelihood that cases will be resolved by a guilty plea instead of going to trial (White, 2014). One of those studies was the BWC evaluation in Aberdeen and Renfrewshire that found that guilty pleas increased by 71 to 80 percent when BWC recordings were used as evidence in the



case (ODS Consulting, 2011). In Canada, the introduction of video evidence has also been seen to increase the number of guilty pleas. The Chief Crown Prosecutor in Edmonton estimated that guilty pleas increased by 30 percent when video evidence was involved (EPS, 2015). The benefit of decreased volume of trials could potentially be significant in Canada, as overloaded court systems find themselves routinely dealing with backlogs of court cases (Humphreys, 2013; Parsons, 2017). Efficiency in dealing with court cases in an expedited manner is of particular importance in the Canadian court system since the Supreme Court of Canada decision in *R. v. Jordan* in July of 2016 directed that Provincial and Superior Court cases should typically be resolved in 18 and 30 months, respectively.

### **Officer Performance and Training**

One of the potential benefits of BWC which has not received a significant amount of study is increased efficiency in the areas of officer performance and training. During a BWC study in Rialto, California, it was noted that several officers routinely downloaded and reviewed the video recordings from their BWC to review the interactions they had been involved in with the public (Ariel et al., 2014). It is a common practice for professional athletes to review video recordings of their performances in order to train and improve their future performance. Similarly, the potential benefits of utilizing BWC video recordings for training of both individual and groups of police officers could be significant. Training could be designed for officers to learn from their own previous interactions and the real life experiences of fellow officers in order to improve their interaction with suspects, victims and witnesses to become more professional and effective in their duties (Ariel et al., 2014). The potential benefit from the concept of using BWC video as a training aid to improve professionalism and facilitate continuous improvement is suggested in the body-worn video guidance document of the College of Policing in the United

Kingdom. The guidance document states that police agencies can use BWC video to review incidents and improve how officers deal with similar situations (College of Policing, 2014). Advocates concerned with ensuring police officers are compliant with the law and respectful of citizen rights have discussed the potential benefits of BWC video being utilized for the purpose of training officers for improved performance in those areas (Harris, 2010). The UK Home Office Guidance for the Police Use of Body-Worn Video Devices issued in 2007 takes into account the review of the first UK BWC study conducted in Plymouth the previous year. The document made several conclusions regarding the use of BWC in policing, including favouring their use for training purposes, stating that “[t]he ability to review their performance in detail after an incident is a powerful tool for officers to highlight effective and ineffective actions” (Home Office, 2007, p. 8). Likewise, the USDOJ released a report on recommendations and lessons learned for implementing a BWC program for police agencies. In that report it was noted that many police agencies were already using BWC video as a training tool and it had been found to be useful in improving officer performance (Miller & Tolliver, 2014).

### **Privacy Concerns**

Despite the noted potential benefits of BWCs on improving trust with the public, reducing the number of complaints and the associated costs of investigating those complaints, contributing towards enhancing police investigations, and being utilized in future training exercises, there are still some significant challenges to the use of BWCs. The subject of government electronic surveillance has caused concern in modern western society. In Canada, the Charter of Rights and Freedoms protects citizens against indiscriminate video surveillance without cause. Similar privacy concerns have been raised with regard to police use of other technological advancements, such as automated license plate recognition technology (Cohen,

Plecas, & McCormick, 2007; McCormick, Cohen, & Davies, 2017). In order to justify the widespread use of BWCs by police, there must be a demonstrable benefit for society that outweighs the intrusion into personal privacy of a large number of law abiding citizens. The routine use of BWCs by police results in the collection of a substantial amount of video recordings, and in a sense, creates a broad video surveillance project conducted by police. Not only are individuals involved in police incidents recorded by police, but other members of the public will also unwittingly be recorded while they go about conducting unrelated business in public, and sometimes private, areas. The privacy interest of citizens must be protected and balanced against the increased police accountability and evidentiary benefits that would be provided by the widespread use of BWCs (Stanley, 2015). Civil rights advocacy groups such as the American Civil Liberties Union (ACLU) have examined the issue of citizens' privacy rights in relation to the use of BWCs by police. The ACLU published a paper on the issue of police use of BWCs that publically declared its support for the use of BWCs by police but also identified two key areas it found to be of concern in protecting the privacy rights of the public if BWCs are used by police. The first was that the use of BWCs should be conducted primarily by uniformed police officers with the device being easily visible and officers advising persons they are being recorded when practicable. The second was that the BWC recordings should be retained only as long as necessary, with recordings that provide evidence of crimes or police misconduct being flagged for longer retention and those recordings that have no apparent evidentiary value being purged after a set period of time that should only be a few weeks in length (Stanley, 2015).

The concerns of advocacy groups regarding the potential privacy issues have been reflected in several documents from leading agencies providing direction on the implementation

and use of BWC by police. In the United States, the National Institute of Justice (NIJ) published *A Primer on Body-worn Cameras for Law Enforcement*. In that guidance document, it was noted that agencies must be sensitive to the privacy legislation within the local jurisdiction when considering how and when the devices should be utilized. It also states that there is a need to establish the circumstances in which the use of the BWC would be voluntary, compulsory, and prohibited when deployed by police (ManTech Advanced Systems International, 2012). The USDOJ also addressed similar considerations in providing direction to police agencies with regard to the use of BWCs. The USDOJ specifically notes that BWCs are a much more dynamic and intrusive recording platform than traditional static surveillance cameras. This is due to the fact that BWCs record up close audio and video, provide police with the ability to record inside private dwellings, and film sensitive situations that develop during calls for service. This is in contrast to widespread traditional surveillance cameras which are far more limited and typically restricted to public areas (Miller & Tolliver, 2014; Cohen et al., 2007; McCormick et al., 2017). BWCs capture the potentially traumatic experiences of victims of crime, persons involved in medical distress and accidents, and persons who are arrested. Consideration should be given that this intrusion into their privacy may exacerbate the emotional trauma experienced by those persons (White, 2014).

Many police agency policies on BWC usage contain direct reference to the privacy concerns noted in both publications from advocacy groups such as the ACLU and guidance documents from government agencies. These policies contain not only reference to these concerns but often provide direction to police officers on informing the public that they are being recorded, to ask for permission to record within a private residence, and other situations when they should and should not use the BWC to record (Seattle Police Department, 2014; Phoenix

Police Department, 2013; Chicago Police Department, 2015). In Canada, the Office of the Privacy Commissioner of Canada has examined this subject with assistance from, or in consultation with, the privacy oversight offices of every province and territory. This examination resulted in the publication of a report providing guidance for the use of body-worn video for law enforcement. The core issue focused on in the report was the balance of privacy versus the needs of law enforcement to gather evidence, increase officer accountability, and protect officers against unfounded complaints of misconduct (Office of the Privacy Commissioner of Canada, 2015). The Privacy Commissioner of Canada has laid out a four-part test to assist police in determining if body-worn video should be implemented. This four-part test addresses the issues of necessity, effectiveness, proportionality and alternatives. The issue of necessity requires that there must be an operational necessity that policy agencies face that BWCs are a solution for, and they are not just being deployed because they are a popular tool in law enforcement. The issue of effectiveness requires police agencies to evaluate if BWCs are likely to be effective in providing a solution to the operational necessity identified. The issue of proportionality addresses the inevitable loss of privacy that will result from individuals being video recorded by police. The extent of that intrusion into personal privacy must be minimized by the manner in which the devices are used and must be justified in comparison to “significant and articulable benefits” (Office of the Privacy Commissioner of Canada, 2015, P. 4). The issue of alternatives requires that police agencies consider other measures that would be less privacy invasive and may achieve the same objectives.

In addition to concerns about infringing upon privacy rights of members of the public, another area of concern discussed with regard to BWC use by police and privacy rights is the potential uses of the video recordings from BWCs. The possibility that BWC may be integrated

with other technologies causes concerns for preserving individual privacy. Integrating technologies such as GPS tracking enriches the recording and potentially reduces the privacy of a member of the public as it records additional personal data regarding them and their activities (Coudert et al., 2015). More concerning is the use of powerful biometric technologies. Facial recognition is becoming more commonplace and is a cause of concern with the possibility of directly integrating it with BWC recordings. This would potentially allow police to automatically and nearly instantly identify individuals from photos in existing databases, such as police booking photos that may be held in a repository shared between multiple agencies. This could be done for a variety of purposes, such as locating known offenders wanted on outstanding arrest warrants, regardless if the individual were the subject of a specific investigation or simply a member of the public inadvertently recorded by the BWC (White, 2014; Miller & Tolliver, 2014; Coudert et al., 2015). In 2014, The Calgary Police Service had already taken steps to integrate their BWC system with facial recognition technology, which potentially expands the utility of the BWC tool beyond monitoring police and public conduct (Bud, 2016).

In addition to concerns of the privacy rights of members of the public, there is concern about the privacy rights of police officers. Police officers who are mandated to wear BWCs by their agency are subject to a higher level of scrutiny than they would be without the BWC. Their conduct and conversation throughout their shift, including during personal time such as during meal breaks or on a personal phone calls are potentially subject to public recording from their own BWC or that of a co-worker. This potential intrusion into the privacy of police officers has been recognized by police organizations. The IACP has recognized that there is a reasonable expectation of personal privacy for police officers in circumstances such as inside locker rooms or when they are on breaks. The IACP has recommended that use of BWCs be restricted to

operational settings only, and that they should not be used during administrative situations such as guidance sessions or personnel evaluations (IACP, 2014). The concerns over the privacy impacts on officers has been echoed by police unions. This was the case when the topic of implementing BWCs was discussed at several large United States police departments, including Las Vegas and Phoenix, where it was characterized as a change in working conditions or scope of work that subsequently must be negotiated with the unions (White, 2014).

### **Technological Limitations**

The implementation of new technology has always brought with it a variety of obstacles that must be overcome. The implementation of BWCs brings with it several issues that prevent this technology from being a perfect tool. One of the primary issues with video recordings of police interactions taken by the public with their mobile devices is that the recording typically begins either during the interaction or after the primary interaction is over. In order to ensure that BWCs adequately capture an interaction in its totality, which will assist reviewers in understanding the context, the devices must auto-buffer recording prior to the start button being pressed by the officer. This will capture the beginning of unexpected events that the officer could not anticipate (Coudert et al., 2015). It is unclear however, how long of a period should be held in an auto-buffer in order to ensure an effective and reasonable view of unanticipated situations. As a result, it is unknown if current technology can meet the demands to achieve that standard.

As BWCs are electronic devices, they are susceptible to equipment malfunction and error. In the review of the Aberdeen and Renfrewshire BWC project, it was found that there were repeated problems with device errors. During the study period there were multiple occasions where there was a loss of the date and time on the recordings. The BWC would also

incorrectly reset the identification setting of the officer using it (Ellis et al., 2015). Similar issues have been encountered during BWC trials with Canadian police agencies. In one such trial conducted by the TPS, it was found that the corruption of video was a major challenge with both makes of BWCs that were tested. Both manufacturers provided recovery tools that were not entirely effective in successfully recovering the lost audio and video (TPS, 2016). Another trial conducted by the EPS experienced issues of times and dates resetting to factory default, similar to those experienced in the Scottish project (EPS, 2015).

Further, the capabilities of the current technology available in BWC products are limited. BWCs are small devices intended to be worn on a police officer's head, chest or shoulder. The size and design of these devices limits their effectiveness. In 2015, Defense Research and Development Canada (DRDC) published an evaluation of BWC technology it had prepared for the RCMP. This evaluation found significant limitations to the field of view of four commercially available BWC devices. The manufacturers of the four BWC products tested claimed fields of view ranging from 75 degrees to 170 degrees. During testing, DRDC found that the actual maximum measured field of view in the devices varied from a low of 63 degrees to a high of 113 degrees. Limitations in the field of vision of BWC recording has also been noted as a shortcoming of the technology in studies conducted by other police agencies (DRDC, 2015; EPS, 2015). The field of vision of a human being is approximately 200 degrees horizontally and 135 degrees vertically (Schneck & Dagnelie, 2011). This is substantially greater than the commercially available BWC devices, limiting their ability to provide an account of events truly representative of the perspective of the officer wearing the device.

The evaluation conducted by DRDC on the four BWC devices found that there was noticeable curvature distortion during testing, where the recorded image applied a "fisheye"



effect to the recorded image, distorting the actual proportions of the objects recorded. This became more pronounced at short distances and when using a larger field of view. Three of the four devices were capable of operating at variable recording resolutions, from 480 to 1080 pixels and recording speeds of 30 or 60 frames per second, depending on the resolution selected. Each of the devices configured differently provided varying results when tested while recording a subject at distances of seven and twenty feet. Several of the recordings were distorted or blurred sufficiently to prevent or question the possible identity of the subject recorded. Not surprisingly, the quality of the image generally showed improvement when the recording resolution was increased on each of the three devices that provided variable settings. Increasing the resolution of the video recording has a converse relationship with the recording capacity of the device as more storage space is required for those higher resolution recordings (DRDC, 2015).

Another factor that limits the ability of BWCs to provide a truly reflective account of events from the perspective of the officer involved is the issue of mounting location. In evaluating seventeen different mounting possibilities for BWCs on officers, it was found that there was no definitive suitable and secure mounting technique and position (DRDC, 2015). That evaluation and others have found that there were many challenges related to the mounting of BWCs on officers, including interference with other equipment and tools (DRDC, 2015; EPS, 2015). It was also found that a variety of potential body positions may interfere with BWC recording or the camera may likewise interfere with the police officer's mobility. The EPS BWC pilot program evaluation also highlighted two additional issues with the mounting of BWCs on officers. The first was that the cold winter climate in Edmonton requires officers to wear layered uniforms and a variety of hats. As a result, any BWC deployed by the police service must easily attach and detach from a variety of uniform items as well as fit with each type of hat. The

second was that during the pilot project it was found that in use of force situations the video recorded did not fully capture the interactions. This was due to the BWC becoming partially or fully dislodged during the majority of physical encounters (EPS, 2015). The evaluation of the TPS BWC pilot program also expressed concerns over the challenges experienced by officers in mounting BWCs to optimize video and audio recording during interactions with the public. The evaluation stated that further review of the mounting options was required if BWC was to be adopted by the agency (TPS, 2016). A common mounting location for many BWC devices is the officer's chest. As the device can create a gap between layers of a body armour system such as the binary soft and hard system utilized by the RCMP, it may reduce the effectiveness of that system (DRDC, 2015). This mounting method is also prone to capturing video that is not representative to the officer's point of view. This is often caused by the BWC facing forward and not in the direction that officer's head is turned. It is also commonly caused by the officer's hands or arms blocking the video when they are manipulating other equipment such as their radio or firearm (Katz & Kleger-Heine, 2015).

The mounting methodology can cause additional problems beyond the issue of failing to accurately record the officer's perspective. The physical design of some BWC devices has been found to cause additional problems. The EPS found that the wire that connected the BWC to the associated battery pack often got caught in other equipment, including the seatbelt of the patrol car (EPS, 2015). The Los Angeles Sheriff's Department (LASD) experienced similar issues with BWCs, also finding that the BWC got caught in the officer's seatbelt on a frequent basis (Katz & Kleger-Heine, 2015).

Uniformed police officers work shifts of varying lengths depending upon their police agency and duties. Some police agencies that have conducted BWC pilot projects utilized shifts

as long as twelve hours in length, such as the EPS and the RCMP (EPS, 2015; DRDC, 2015). Other agencies had officers working assigned shifts as short as eight hours, such as the LASD. Surprisingly, the LASD, working eight hour shifts, had higher requirements for BWC battery life than those working ten or twelve hour shifts. This was due to officers frequently working double shifts, resulting in them working sixteen hours, instead of the normally assigned eight hours (Katz & Kleger-Heine, 2015). The issue of battery life for BWC units was identified as a considerable challenge by many police agencies who have piloted BWC devices.

The TPS found that battery life was the most critical challenge during their pilot project. The two devices tested fell well short of the ten hour battery life required for most officers' shifts. While it was possible for officers to attend their office and return their BWC for a charged unit, it was time consuming and inconvenient to accomplish this. Further complicating this was the need for a supervisor to attend and assign the camera to their badge number. Several methods were attempted to allow officers to recharge the battery in the field but all were deemed ineffective or impractical (TPS, 2016). During their pilot project, the EPS found that both models of BWC devices they tested had limited battery life insufficient for their extended shifts. This prompted officers to modify their use of the BWC, limiting the volume of interactions they recorded during their shifts. In extremely cold weather, the battery life of one of the BWC units was reduced to approximately 30 minutes. The NIJ published an informational overview of eighteen BWC devices that were available for purchase in the United States. Fourteen of those devices had internal batteries which could not be changed and the device itself had to be taken out of service to be recharged. The charging times of those units with internal batteries ranged from two and a half to six hours to recharge. The recording times of the units varied considerably from one and a half to twelve hours on a single charge. Of the eighteen devices

listed, only four of them had recording times higher than six hours, with two of them reporting eight hour recording times and the other two reporting twelve hours (ManTech Advanced Systems International, 2014). If the recording time of a single charge were sufficient for an entire shift, police agencies will still need a considerably higher number of BWC devices than officers on a single shift. At shift change, officers cannot simply hand over their BWC devices to another officer when they are finished with them. The considerable recharging time of all devices constrains the supply of devices and necessitates that many more devices must be in service for officers coming on shift while returned devices are recharged. The need for a significant number of additional devices to cover the logistics of shift change will increase equipment costs for a BWC program accordingly.

Implementing a full-scale BWC program for uniformed officers in a police agency brings with it a number of financial costs. Some of those costs are obvious, such as the initial purchase of BWC devices. There are however, a number of other associated costs and ongoing expenses related to maintaining a BWC program that can have a significant financial impact on a police agency and potentially negative effects on operational capacity. These costs include things such as hardware repair and replacement; data storage; officer administration time; and information requests from the public (Fitzgerald & Bagg, 2016; TPS, 2016; Katz & Kleger-Heine, 2015).

BWC devices, like any electronic device, have a useful lifespan after which they must be replaced. Several factors influence the timeline for replacement of devices including device reliability and improvements in technology. The USDOJ provided US\$23 million to law enforcement agencies to facilitate the purchase 50,000 BWCs (USDOJ, 2015). While this grant may have been pivotal in many police agencies implementing BWC programs, there is no provision for future funding. The public announcement from the USDOJ does not comment on

the issue of ongoing maintenance and upgrades to the BWC equipment purchased for the initial BWC program rollout using this grant. Police agencies are now left to carry the financial burden and fund the ongoing costs of replacing the BWC equipment as required out of their own budgets.

The informational overview of eighteen BWC devices published by the NIJ listed the manufacturer's suggested retail price for the BWC devices to range significantly from a low of US\$150 to a high of US\$1,000 (ManTech Advanced Systems International, 2014). That same publication also showed that basic manufacturer warranties ranged from a low of 90 days to a high of three years. Sixteen of the eighteen devices had a basic warranty of one year. Given the length of warranty on the devices, after a year, most police agencies could expect to begin having to replace units that failed. Additionally, day to day wear and tear will inevitably result in damage to at least a small number of units. As BWC devices have not been used in high volume on a long term basis it is unknown how durable they will prove to be. The specifications for the wide variety of devices available shows that some have no certified environment or durability testing while the remaining devices use a variety of different standards to demonstrate durability (ManTech Advanced Systems International, 2014). Replacing BWC devices due to the useful lifespan of the device at a cost of up to US\$1,000 per device can be a significant ongoing financial burden on police agencies. Additionally, advances in technology, such as improved field of view, higher resolution, faster frame rates, longer battery life, and improved physical design and functionality will all be factors that will inevitably pressure police agencies upgrade their BWC equipment on an ongoing basis.

## **The Financial Costs of a BWC Program**

Many police agencies have examined the prospect of implementing BWC programs and have estimated the costs involved. The Durham Regional Police Service (DRPS) estimated that the hardware life-cycle for BWC equipment would be five years. The equipment costs associated with initial implementation and replacement every five years was estimated at \$5.2 million based on the assumption that additional devices or storage capacity would be required (Fitzgerald & Bagg, 2016). It is likely that improvements in BWC recording quality and growth in the agency would require increases beyond this estimate of static replacement requirements. The 2016 DRPS budget was \$187.5 million (Regional Municipality of Durham, 2016). The BWC equipment costs are approximately 2.8 percent of the annual budget, meaning that over 0.6 percent of the annual budget each year would be dedicated to BWC equipment costs if they were amortized over the five year period. In evaluating the results of their BWC pilot project, the TPS provided estimated equipment costs for the implementation and maintenance of an agency-wide BWC program over a five year period at \$50.2 million. The 2017 TPS budget is \$1,127.8 million (City of Toronto, n.d.). The BWC equipment costs are approximately 4.5 percent of the annual budget in the first year and amortized over the five year period would be 0.9 percent of the budget each year. The Hamilton Police Service (HPS) also estimated a five year life cycle for BWC equipment in calculating estimates for a 190 device BWC program in 2014. The costs of implementing the program, including equipment and other costs related to the BWC program were estimated at \$3 million per year (EPS, 2015). That equates to approximately 2.1 percent of the \$144.6 million HPS 2104 operating budget (HPS, n.d.).

Beyond the costs of simply acquiring and maintaining BWC equipment, there are substantial expenses for police agencies in the areas of training, downloading and logging video

segments, and processing of disclosure requests to comply with freedom of information legislation. In addition to the costs of equipment noted above, the DRPS estimated that the other associated costs could increase the overall cost of the first year of implementation of a BWC program to approximately \$24 million, which would equate to 12.4 percent of the 2017 operating budget. Additionally, recurring annual costs in subsequent years for salary and lost patrol time was estimated at \$17.8 million (Fitzgerald & Bagg, 2016).

One of the largest cost drivers in police agency budgets is the salary costs of employees. For example, the 2014 budget of the HPS was \$144.6 million. The bulk of expenditures were related to salaries and benefits of employees, accounting for nearly \$135.5 million, which was approximately 93.7 percent of the total budget (HPS, n.d.). Similarly, the 2017 budget of the TPS was \$1.13 billion with \$1.01 billion designated for employee salaries and benefits, comprising approximately 89 percent of the total budget (City of Toronto, n.d.). The introduction of a full-scale BWC program in a police agency can have a significant impact on the productivity of front line officers resulting in a reduced level of service or additional costs incurred to maintain the same level of front line policing service. This issue has been highlighted in various countries where BWCs have been tested or introduced into regular operations. In the United Kingdom, during the review of the BWC pilot project on the Isle of Wight, there was feedback from many investigative officers who questioned the value of BWC video as it had little benefit in the majority of cases but created a high volume of evidence that required viewing and editing (Ellis et al., 2015). Officers are required to catalogue the video segments from their BWC as they are aware of what incident each video segment relates to. They may also be required to classify recordings as evidentiary in nature or not. A civilian clerk would be required to review the video recordings in their entirety and may still not be able to

accurately classify some recordings. In the United States, the review of the LASD BWC pilot project found that the workload of front line officers was significantly affected. The process of downloading video from their BWC routinely took officers up to an hour per shift. With officers working eight hour shifts, that would either occupy approximately 12.5 percent of each shift if they returned to the station early to complete that task, or they would be paid an hour of overtime to complete the downloading (Katz & Kleger-Heine, 2015). In Canada, the experience has been similar. The BWC pilot project evaluation completed by TPS stated that participating officers spent differing amounts of time reviewing, classifying, and downloading BWC video at the end of their shifts. The length of time required was largely dependent upon the duties the officer was assigned to and the number of contacts the officer had with the public during the shift. It was determined that an average of 39 minutes per shift was required by each officer to complete this task. The report extrapolated this figure to estimate that officers would spend roughly one hundred to one hundred and fifty six hours per year on this task (TPS, 2016). The report stated that “[a]ll constables who were interviewed at the end of the pilot, said that the body-worn cameras had definitely added to their administrative workload” (p. 44). The report further stated that given current factors, such as training, sick leave, and annual leave, front line patrol constables are available for approximately 79 percent of their total scheduled hours. It was estimated that the implementation of BWCs could reduce the level of availability for front line constables by five percent to approximately 74 percent of their total scheduled hours due to the increased mandatory tasks related to processing of the BWC video (TPS, 2016).

In addition to the added daily workload, training on the BWC must be provided to the officers to ensure that they are competent at operating the devices, downloading the video, and following the policy of use prescribed by the agency. The training program content and duration



will differ for each agency but one example of training time is the training program that was developed by the TPS for the purpose of their BWC pilot project. This training was four days in length, accounting for approximately one 40 hour work week (TPS, 2016). It is logical that other Canadian police agencies would implement training programs similar in scope due to similar legal requirements, training standards, and policy considerations. The subject of training was noted in the EPS report on their BWC pilot project. It was stated that it was essential to deliver training in the areas of physical operation of the BWCs, procedural knowledge and confidence, and buy-in to the concept of BWC usage (EPS, 2015).

Front line sworn officers are not the only employees of a police agency whose workload is affected by the introduction of BWC. The tasks of retrieving and redacting BWC video recordings for disclosure regarding an incident where charges are forwarded may be conducted by either the officers themselves or support staff. The TPS BWC pilot project evaluation report noted that the workload experienced in completing these tasks was an average of 68 minutes to process each request. Based upon the additional anticipated workload from a full BWC program, it was estimated that TPS would need to hire an additional seven video analysts to deal with the initial increase in workload (TPS, 2016). It was also noted that in-car camera video requests had increased sevenfold since that technology was introduced and if BWC video requests increased from this initial level, further increases in support staff and a larger facility may be required (TPS, 2016). In addition to retrieving and redacting BWC video for court purposes, freedom of information laws in jurisdictions across Canada allow the public to request information held by government agencies. There can be a considerable workload created by the need to vet the information that is released through these requests. As an example, in Ontario the Municipal Freedom of Information and Protection of Privacy Act (MFIPPA) requires such information

requests to be completed within 30 days. During the TPS pilot project, several requests for video were made under the MFIPPA. The processing of one five minute video required over four hours to vet appropriately for release (TPS, 2016). The substantial time required to vet BWC video for privacy requests was also observed during the BWC pilot project in Mesa. While the required amount of time to complete each request varied considerably, it was found that three of the more complicated requests required approximately 10 hours each to complete (Mesa Police Department, 2013). The pressure that these freedom of information requests will add to the workload of police agency records departments could subsequently have significant financial implications that could make implementation of BWCs cost prohibitive for many agencies.

### **Conclusion**

The idea of equipping uniformed police officers with BWCs has been explored in policing for over a decade. The social turmoil that has occurred in response to police use of force against minorities in the United States since 2014 increased the calls for BWCs as a method of holding police accountable through increased transparency by recording their interactions with members of the public. The same lack of trust of the police is not widespread in Canada where less than 0.1 percent of police and public interactions involve any use of force at all, with even fewer of those incidents involving any significant level of force. Canadians continue to have high levels of confidence in their police agencies, even after highly publicized events in the United States and in Canada.

BWCs have been proposed as a tool to limit violent interactions between police and citizens. As BWCs have only been used in policing on a wide-scale basis for a limited amount of time, there has been limited research as to their effectiveness in reducing the use of force by police but preliminary research has shown that in some circumstances BWCs may actually

increase the frequency of police using force against citizens. The same research has also shown that the use of BWCs may increase the frequency of assaults upon police. There has also been conflicting research as to whether the use of BWCs reduces the number of public complaints against police through modifying the behaviour of police or dissuading unfounded complaints. In Canada in particular, there has been very limited evidence that BWCs reduce complaints.

The effectiveness of BWCs as evidence gathering tools has also been discussed. BWCs may provide a recording of an event more aligned with the perspective of the officer involved than third party video recordings, which may assist in assessing their actions during an interaction. There has also been limited evidence that the use of BWCs may increase charges in domestic violence investigations. Given the strong focus on prosecuting domestic violence that already exists in Canada, there may not be any benefit observed in this area. The existence of video recordings has been found to increase the number of guilty pleas that reduces the workload of overburdened courts, however the additional workload required to provide that evidence in a timely manner may outweigh that benefit.

Having video from police interactions with the public will provide an additional tool to train officers in handling different situations. While this may prove useful, effective training in this area can continue to be developed and delivered without the aid of BWC video from those interactions.

Privacy rights are held in high regard in Canada. The widespread use of BWCs causes a loss of privacy for suspects, victims, witnesses, and bystanders alike. The police will record massive amounts of video, not only in public areas but within private residences and when some individuals will be in a vulnerable state. Having BWCs on police officers throughout their entire shifts also intrudes upon their personal privacy with the constant concern that they may be

recorded by their own device or that of a co-worker while they are not engaged in interactions with the public that may require recording by policy. The potential use of other technologies in conjunction with BWC video, such as facial recognition analysis, brings about additional serious privacy concerns with the widespread use of BWCs.

By their very nature, BWCs have difficulty recording from the exact perspective of an officer involved in an interaction. The BWC may not be facing in the same direction as the officer or may be blocked by the officer while they are performing dynamic activities. The limitations of the current technology prevent an accurate representation of an officer's full field of view or the same level of clarity and detail as experienced by the officer. Additionally, the current devices are limited by other factors such as reliability, recording capacity, and battery life.

The costs of a large scale BWC program will bring with it substantial financial costs for a police agency. The equipment required is not limited to BWC devices, but also includes data storage servers. The equipment is expensive and is subject to an estimated five year lifespan before replacement. The cost of lost productivity by officers downloading and processing video each shift will have a noticeable effect on the capacity of the police agency to provide policing services. With salary related costs comprising large portions of Canadian police agency budgets, police executives should be seeking ways to limit the pressure on current resources, not increase them. Police agencies will also experience substantial costs related to redacting BWC video for court when the majority of recordings will have limited evidentiary value. Further additional costs will be incurred as freedom of information requests will require considerable vetting of BWC video prior to release.

Consideration of all of these factors shows that the adoption of a large-scale BWC program by police agencies would be a costly undertaking, using significant funds that will either result in a reduction of current programs, or preclude the implementation of additional initiatives. Such a program will have little benefit in the Canadian context where public confidence in police remains high and personal privacy is highly valued. There may be some benefit in restricted use of BWCs in some specific situations where heightened risk of physical confrontation between citizens and police exists, such as public protests. However, the significant costs involved in implementing and operating a large-scale BWC program in Canadian police agencies far outweighs the limited potential benefits.

## References

- Ariel, B., Farrar, W., & Sutherland, A. (2015). The effect of police body-worn cameras on use of force and citizens' complaints against the police: A randomized controlled trial. *Journal of Quantitative Criminology*, 31(3), 509-535. doi:10.1007/s10940-014-9236-3
- Ariel, B., Sutherland, A., Henstock, D., Young, J., Drover, P., Sykes, J., & ... Henderson, R. (2016a). Report: increases in police use of force in the presence of body-worn cameras are driven by officer discretion: a protocol-based subgroup analysis of ten randomized experiments. *Journal of Experimental Criminology*, 12(3), 453-463. doi:10.1007/s11292-016-9261-3
- Ariel, B., Sutherland, A., Henstock, D., Young, J., Drover, P., Sykes, J., & ... Henderson, R. (2016b). Wearing body cameras increases assaults against officers and does not reduce police use of force: Results from a global multi-site experiment. *European Journal of Criminology*, 13(6), 744-755. doi:10.1177/1477370816643734
- Boivin, R., & Lagacé, M. (2016). Police Use-of-Force Situations in Canada. *Police Quarterly*, 19(2), 180-198. doi:10.1177/1098611115613953
- Bud, T. K. (2016). The rise and risks of police body-worn cameras in Canada. *Surveillance & Society*, 14(1), 117-121.
- Butler, C., & Hall, C. (2008). Use of force by police, and resulting injuries to subjects and officers – A description of risk in one major Canadian city. *Law Enforcement Executive Forum*, 8(6), 141-157.
- Calgary Police Service. (2015). *Body worn cameras (new)*. Retrieved from [http://www.calgary.ca/cps/Documents/Body\\_Worn\\_Camera\\_Policy.pdf](http://www.calgary.ca/cps/Documents/Body_Worn_Camera_Policy.pdf)

- Carlsmith, K. M., & Darley, J. M. (2002). Why do we punish? Deterrence and just deserts as motives for punishment. *Journal of Personality and Social Psychology*, 83(2), 284-299.  
doi:10.1037//0022-3514.83.2.284
- Chicago Police Department. (2016). *Body Worn Cameras*. Retrieved from <https://www.bwcorecard.org/static/policies/2016-05-10%20Chicago%20-%20BWC%20Policy.pdf>
- City of Toronto. (n.d.). *Preliminary budget overview*. Retrieved from <http://www1.toronto.ca/City%20Of%20Toronto/Strategic%20Communications/City%20Budget/2017/PDFs/2017%20PreliminaryBudgetOverview%20final%20singlepages.pdf>
- Cohen, I. M., Davies, G., & McCormick, A.V. (2015). *The city of Surrey public safety survey 2014*. Retrieved from <http://www.ufv.ca/media/assets/criminal-justice-research/Surrey-RCMP-Public-Safety-Report-2014.pdf>
- Cohen, I. M., & McCormick, A. V. (2016). *West Vancouver public safety survey research results*. Retrieved from <http://cjr.ufv.ca/wp-content/uploads/2017/01/West-Van-Pub-Saf-Rep.pdf>
- Cohen, I. M., Plecas, D., & McCormick, A. V. (2007). *A report on the utility of the automated licence plate recognition system in British Columbia*. Retrieved from <https://www.ufv.ca/media/assets/ccjr/publications/ALPR.pdf>
- Cohen, I. M., Plecas, D., & McCormick, A. V. (2009). *Public Safety Survey Burnaby*. Retrieved from [http://www.ufv.ca/media/assets/ccjr/reports-and-publications/Public\\_Safety\\_Burnaby.pdf](http://www.ufv.ca/media/assets/ccjr/reports-and-publications/Public_Safety_Burnaby.pdf)

- Cohen, I. M., Plecas, D., & McCormick, A.V. (2009b). *Public Safety Survey Upper Fraser Valley Area*. Retrieved from [http://www.ufv.ca/media/assets/ccjr/reports-and-publications/Public\\_Safety\\_Upper\\_Fraser\\_Valley.pdf](http://www.ufv.ca/media/assets/ccjr/reports-and-publications/Public_Safety_Upper_Fraser_Valley.pdf)
- College of Policing. (2014). *Body-worn video*. Retrieved from <http://www.bwvsg.com/resources/procedures-and-guidelines/>
- Cotter, A. (2015). *Public confidence in Canadian institutions*. Retrieved from <http://www.statcan.gc.ca/pub/89-652-x/89-652-x2015007-eng.htm>
- Coudert, F., Butin, D., & Le Métayer, D. (2015). Body-worn cameras for police accountability: Opportunities and risks. *Computer Law & Security Review*, 31(6), 749-762.  
doi:10.1016/j.clsr.2015.09.002
- Davey, M., & Bosman, J. (2014, November 24). Protests flare after Ferguson police officer is not indicted. *The New York Times*. Retrieved from <https://nyti.ms/1yNsywu>
- Defence Research and Development Canada. (2015). Scoping, technical, and operational evaluation of body worn video: CSSP-2014-TI-2031 final report. Retrieved from [http://cradpdf.drdc-rddc.gc.ca/PDFS/unc199/p802456\\_A1b.pdf](http://cradpdf.drdc-rddc.gc.ca/PDFS/unc199/p802456_A1b.pdf)
- Dilulio, J. J. (2005). Deterrence Theory. In M. Bosworth (Ed.), *Encyclopedia of prisons & correctional facilities*. Thousand Oaks, CA: Sage.
- Edmonton Police Service. (2015). *Body worn video: Considering the evidence*. Retrieved from <http://www.bwvsg.com/wp-content/uploads/2015/06/Edmonton-Police-BWV-Final-Report.pdf>
- Ellis, T., Jenkins, C., & Smith, P. (2015). *Evaluation of the introduction of personal issue body worn video cameras (Operation Hyperion) on the Isle of Wight: Final report to*



- Hampshire Constabulary*. Retrieved from <http://www.bwvsg.com/resources/studiesreports/>
- Fitzgerald, S., & Bagg, J. (2016, November 14). *Report to the police services board*. Retrieved from [http://www.drps.ca/upload\\_files/8hNov142016.pdf](http://www.drps.ca/upload_files/8hNov142016.pdf)
- Floyd v. City of New York* (2013), 08 Civ. 1034 (SAS). Case 1:08-cv-01034-SAS-HBP.
- Hall, C., Votova, K., & Wood, D. (2013). *Prospective analysis of police use of force in four Canadian cities: Nature of events and their outcomes*. Retrieved from <http://publications.gc.ca/pub?id=9.816435&sl=0>
- Hamilton Police Service. (n.d.). *2014 budget*. Retrieved from [https://hamiltonpolice.on.ca/sites/default/files/2014\\_budget.pdf](https://hamiltonpolice.on.ca/sites/default/files/2014_budget.pdf)
- Harris, D. A. (2010). *Picture this: Body worn video devices (“Head Cams”) as tools for ensuring fourth amendment compliance by police*. Retrieved from <http://ssrn.com/abstract=1596901>
- Home Office. (2007). *Guidance for the police use of body-worn video devices*. Retrieved from <http://library.college.police.uk/docs/homeoffice/guidance-body-worn-devices.pdf>
- Humphreys, A. (2013, May 3). ‘The system is sick’: Canada’s courts are choking on an increase in evidence. *National Post*. Retrieved from <http://news.nationalpost.com/news/canada/canadas-courts-are-choking-on-an-increase-in-evidence>
- Hung, V., Babin, S., & Coberly, J. (2016). A market survey on body worn camera technologies. National Institute of Justice. Retrieved from <https://www.ncjrs.gov/pdffiles1/nij/grants/250381.pdf>

- Iacobucci, F. (2014). *Police encounters with people in crisis*. Retrieved from [https://www.torontopolice.on.ca/publications/files/reports/police\\_encounters\\_with\\_people\\_in\\_crisis\\_2014.pdf](https://www.torontopolice.on.ca/publications/files/reports/police_encounters_with_people_in_crisis_2014.pdf)
- International Association of Chiefs of Police. (2014). Body-worn cameras model policy. Retrieved from <http://www.iacp.org/Portals/0/documents/pdfs/MembersOnly/BodyWornCamerasPolicy.pdf>
- Janus, A. (2016, September 15). Toronto police want to deploy body-worn cameras service-wide. *CBC News*. Retrieved from <http://www.cbc.ca/news/canada/toronto/bodyworncamerastorontopolice1.3764092>
- Jennings, W. G., Lynch, M. D., & Fridell, L. A. (2015). Evaluating the impact of police officer body-worn cameras (BWCs) on response-to-resistance and serious external complaints: Evidence from the Orlando police department (OPD) experience utilizing a randomized controlled experiment. *Journal of Criminal Justice*, 43(6), 480-486.  
doi:10.1016/j.jcrimjus.2015.10.003
- Katz, C. M., Choate, D. E., Ready, J. R., & Nuño, L. (2014). *Evaluating the impact of officer worn body cameras in the phoenix police department*. Retrieved from <https://www.bja.gov/bwc/pdfs/Evaluating-the-Impact-of-Officer-Worn-Body-Cameras.pdf>
- Katz, W. W., Kleger-Heine, E.D. (2015). *Body-worn cameras: Policy recommendations and review of LASD`s pilot program*. Retrieved from

[https://oig.lacounty.gov/Portals/OIG/Reports/Body-Worn%20Cameras\\_OIG%20Report.pdf](https://oig.lacounty.gov/Portals/OIG/Reports/Body-Worn%20Cameras_OIG%20Report.pdf)

Keller, J. (2015, March 20). Ex-Mountie involved in Robert Dziekanski's Taser death found guilty of perjury for lying at inquiry. National Post. Retrieved from <http://news.nationalpost.com/news/canada/ex-mountie-involved-in-robert-dziekanskis-taser-death-found-guilty-of-perjury-for-lying-at-inquiry>

Kelling, G. L., Wasserman, R., & Williams, H. (1988). Police accountability and community policing. *Perspectives on Policing*, No. 7.

ManTech Advanced Systems International. (2012). *Body-worn cameras for law enforcement*. Retrieved from <https://www.publicsafety.gc.ca/lbrr/archives/cnmcs-plcng/cn31878-eng.pdf>

ManTech Advanced Systems International. (2014). *Body-worn cameras for criminal justice: Market survey*. Retrieved from <https://www.justnet.org/pdf/Body-Worn-Camera-Market-Survey-508.pdf>

Mateescu, A., Rosenblat, A., & Boyd, D. (2015). *Police body-worn cameras*. Retrieved from <http://www.datasociety.net/pubs/dcr/PoliceBodyWornCameras.pdf>

McCormick, A. V., Cohen, I. M., & Davies, G. (2017). Assessing the deployment of automated license plate recognition technology: Strategies to improve public safety. In L. Moriarty (ed), *Criminal Justice Technology in the 21<sup>st</sup> Century* (3<sup>rd</sup> edition).

Mesa Police Department. (2013). *End of program evaluation & recommendations: On-officer body camera system*. Retrieved from [http://issuu.com/leerankin6/docs/final\\_axon\\_flex\\_evaluation\\_12-3-13-](http://issuu.com/leerankin6/docs/final_axon_flex_evaluation_12-3-13-)

- Miller, L., & Toliver, J. (2014). *Implementing a body-worn camera program: Recommendations and lessons learned*. Retrieved from <http://www.justice.gov/iso/opa/resources/472014912134715246869.pdf>
- Morrow, W. J., Katz, C. M., & Choate, D. E. (2016). Assessing the impact of police body-worn cameras on arresting, prosecuting, and convicting suspects of intimate partner violence. *Police Quarterly*, 19(3), 303-325. doi:10.1177/1098611116652850
- Mueller, B., & Southall, A. (2014, December 13). 25,000 march in New York to protest police violence. *The New York Times*. Retrieved from <https://nyti.ms/1zOBZOF>
- Nagin, D. S., Cullen, F.T., & Johnson, C.L. (2009). Imprisonment and reoffending. *Crime and Justice: A review of research*, 38. 115-200.
- Nagin, G. S., & Pogarsky, G. (2001). Integrating Celerity, impulsivity, and extralegal sanction threats into a model of general deterrence: Theory and evidence. *Criminology*, 39(4).
- Newport, F. (2016, June 14). U.S. confidence in police recovers from last year's low. Retrieved from <http://www.gallup.com/poll/192701/confidence-police-recovers-last-year-low.aspx>
- ODS Consulting. (2011). *Body worn video projects in Paisley and Aberdeen: Self evaluation*. Retrieved from <http://www.bwvsg.com/resources/studiesreports/>
- Office of the Privacy Commissioner of Canada. (2015). *Guidance for the use of body-worn cameras by law enforcement authorities*. Retrieved from [https://www.priv.gc.ca/information/pub/gd\\_bwc\\_201502\\_e.asp](https://www.priv.gc.ca/information/pub/gd_bwc_201502_e.asp)
- Office of the Mayor Edward B. Murray. (2017). *Mayor Murray and Council President Harrell statement on deployment of body-worn video cameras on Seattle police officers*. Retrieved from

<http://murray.seattle.gov/mayormurraycouncilpresidentharrellstatementdeploymentbodywornvideocamerasseattlepoliceofficers/>

Owens, C., Mann, D., & McKenna, R. (2014). *The Essex Body Worn Video Trial: The impact of Body Worn Video on criminal justice outcomes of domestic abuse incidents*. Retrieved from [http://www.bwvsg.com/wp-content/uploads/2013/07/BWV\\_ReportEssTrial.pdf](http://www.bwvsg.com/wp-content/uploads/2013/07/BWV_ReportEssTrial.pdf)

Parsons, P. (2017, March 9). NDP to hire 65 additional staff to address court backlogs. *Edmonton Sun*. Retrieved from <http://www.edmontonsun.com/2017/03/09/ndp-to-unveil-plan-to-address-court-backlogs-following-hundreds-of-stayed-criminal-cases>

Peak, K. J., & Everett, P. M. (2017). *Introduction to criminal justice: practices and process (2nd ed.)*. Thousand Oaks, CA: Sage.

Phoenix Police Department. (2013). *Body worn technology – Pilot*. Retrieved from <https://www.bwcorecard.org/static/policies/2013-04%20Phoenix%20-%20BWC%20Policy.pdf>

Platt, M. (2016, October 18). Calgary police say body cameras unreliable in the field; possible legal battle ahead. *Calgary Sun*. Retrieved from <http://www.calgarysun.com/2016/10/18/cops-say-body-worn-cameras-unreliable-in-the-field>

Plecas, D., Armstrong, J., Tassone, L., Cohen, I., & McCormick, A. V. (2010). *An analysis of complaints against the RCMP in British Columbia a 15 year review: 1994-2008*. Retrieved from [http://www.ufv.ca/media/assets/ccjr/reports-and-publications/Complaints\\_Against\\_RCMP\\_in\\_BC\\_2010.pdf](http://www.ufv.ca/media/assets/ccjr/reports-and-publications/Complaints_Against_RCMP_in_BC_2010.pdf)

President's Task Force on 21st Century Policing. (2015). *Final Report of the President's Task Force on 21st Century Policing*. Retrieved from

[https://cops.usdoj.gov/pdf/taskforce/taskforce\\_finalreport.pdf](https://cops.usdoj.gov/pdf/taskforce/taskforce_finalreport.pdf)

Regional Municipality of Durham. (n.d.). *2016 business plans & budgets general property tax requirements*. Retrieved from

[http://www.durham.ca/departments/finance/propertytax/2016/2016SummaryBusiness%20Plans\\_PropertyTaxBudgets.pdf](http://www.durham.ca/departments/finance/propertytax/2016/2016SummaryBusiness%20Plans_PropertyTaxBudgets.pdf)

Rogan, M. (2014, August 14). The killing of Sammy Yatim. *Toronto Life*. Retrieved from

<http://torontolife.com/city/the-killing-sammy-yatim/>

Sanchez, R. (2016, August 4). Police shootings highlight concerns about body cameras. *CNN*.

Retrieved from <http://www.cnn.com/2016/08/03/us/policebodycams/>

Schneck, M. E., & , Dagnelie, G. (2011). *Visual prosthetics: Physiology, bioengineering, rehabilitation*. G. Dagnelie (Ed.). New York, NY: Springer.

Seattle Police Department. (2016). *Body-worn video pilot program*. Retrieved from

<https://www.seattle.gov/police-manual/title-16---patrol-operations/16091---body-worn-video-pilot-program>

Sousa, W. H., Coldren, J. R., Rodriguez, D., & Braga, A. A. (2016). Research on Body Worn

Cameras. *Police Quarterly*, 19(3), 363-384. doi:10.1177/1098611116658595

Stanley, J. (2015). *Police body-mounted cameras: With right policies in place, a win for all*.

Retrieved from <https://www.aclu.org/technology-and-liberty/police-body-mounted-cameras-right-policies-place-win-all>

Stocker, D. K., Kocher, C. J., & Gritz, R. L. (2015). The case for body worn cameras:

Transforming policing and community trust. *Police Forum*, 25(1), 3-7.

- Taser International. Retrieved from <https://www.taser.com/press/stats>
- Toronto Police Service. (2016). *Body-worn cameras*. Retrieved from <http://www.tpsb.ca/items-of-interest/send/29-items-of-interest/529-toronto-police-service-body-worn-cameras>
- United States Department of Justice. (2015). *Justice Department awards over \$23 million in funding for body worn camera pilot program to support law enforcement agencies in 32 states*. Retrieved from <https://www.justice.gov/opa/pr/justicedepartmentawardsover23millionfundingbodywornamerapilotprogramsupportlaw>
- Victoria Police Department. (2010). *Proof of concept study: Body worn video & in vehicle video*. Retrieved from <http://www.publicsafety.gc.ca/lbrr/archives/cnmcs-plcng/cn30438-eng.pdf>
- White, M. D. (2014). *Police officer body-worn cameras: Assessing the evidence*. Retrieved from <https://www.publicsafety.gc.ca/lbrr/archives/cnmcs-plcng/cn31934-eng.pdf>
- Yan, H., & Almasy, S. (2014, November 26). London is latest city to see protests as Ferguson dismay spreads. *CNN*. Retrieved from <http://www.cnn.com/2014/11/26/us/nationalfergusondemonstrations/>