

REMOTE ENTANGLEMENT RESTRAINT AS A POLICE USE OF FORCE TOOL

A Review Study of One Year of Field Statistics - -
Police Shooting Deaths

White Paper

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Introduction

Police use of force has been an important issue among the public and law enforcement for many years. Especially in recent years due to circumstances of highly public incidents, involving race, and the increased scrutiny of type of force used by officers. Increasing incidents of suspects failing to comply with verbal commands and rejection of authority only escalates the likelihood of force being applied, creating increasingly volatile encounters.

With cell phone and security cameras everywhere, law enforcement is under intense scrutiny regarding use of force. This scrutiny has officers hesitant to use lethal force, even when their life may be on the line, for fear of “scrutiny” that they, their police department or their family will face as a result. This sadly was the case in the broadly publicized Chicago incident involving Parta Huff, the suspect. The female officer involved was beaten unconscious on October 14, 2016.

In January 2017 a collaborative effort among 11 significant law enforcement leadership and labor organizations in the United States, resulted in the publication of a National Consensus Policy on Use of Force¹. This policy states among other policies:

- Officers shall use only the force that is objectively reasonable to effectively bring an incident under control, while protecting the safety of the officer and others.
- Officers shall use force only when no reasonably effective alternative appears to exist and shall use only the level of force which a reasonably prudent officer would use under the same or similar circumstances.
- An officer shall use de-escalation techniques and other alternatives to higher levels of force consistent with his or her training whenever possible and appropriate before resorting to force and to reduce the need for force.
- When de-escalation techniques are not effective or appropriate, an officer may consider the use of less-lethal force to control a non-compliant or actively resistant individual. An officer is authorized to use agency-approved, less-lethal force techniques and issued equipment
 - to protect the officer or others from immediate physical harm,
 - to restrain or subdue an individual who is actively resisting or evading arrest, or
 - to bring an unlawful situation safely and effectively under control

The above is consistent with the International Association of Chiefs of Police description of the use of force as the "amount of effort required by police to compel compliance by an unwilling subject". Likewise the National Institute of Justice (or “NIJ”, the research, development and evaluation agency of the U.S. Department of Justice) has further stated that law enforcement officers should use only the amount of force necessary to mitigate an incident, make an arrest, or protect themselves or others from harm². The levels, or continuum, of force police use include basic verbal and physical restraint, less-lethal force, and lethal force.

Beyond hand control, current tools/devices that are available to law enforcement today to subdue and detain suspects are classified as either less-lethal or lethal tools. Most of these items can be found on an

officer's belt and more times than not beyond hand control and takedowns they only use a firearm or CEW (conducted energy weapon) with no good options before or in between.

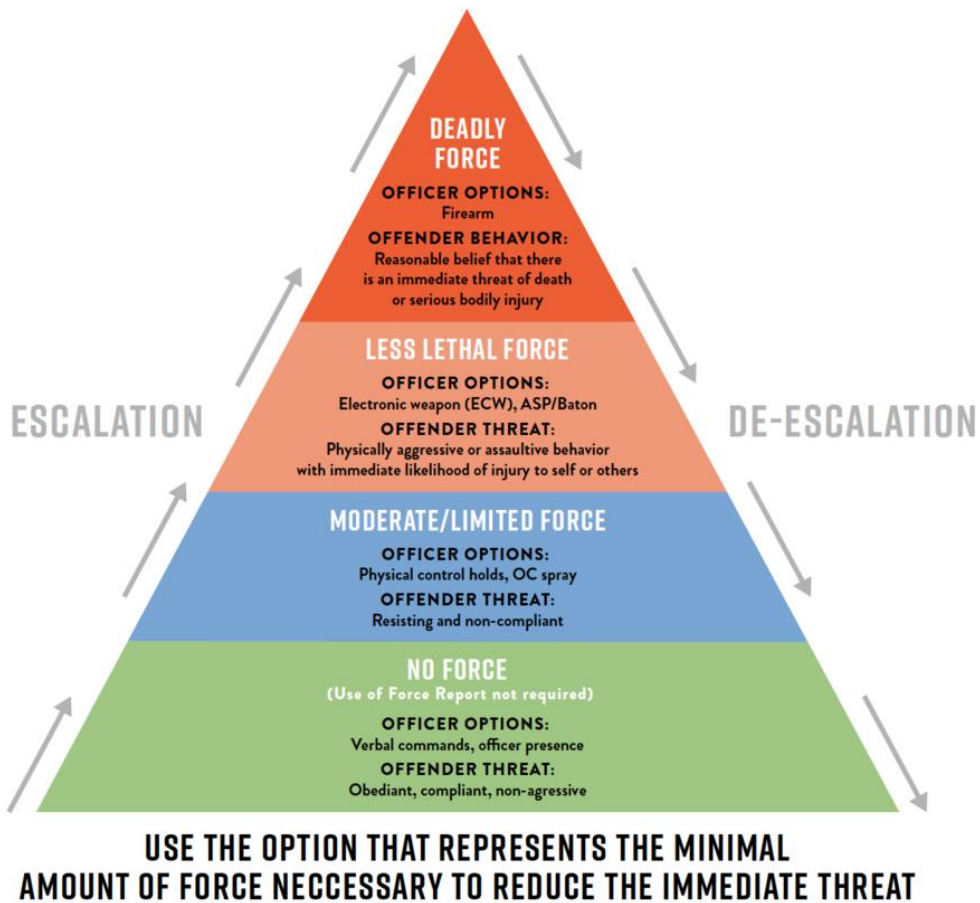
This white paper discusses the use of force continuum, use of force techniques, less-lethal weapons and their application. It also discusses the potential to deploy a new entanglement tool, the BolaWrap 100, to assist law enforcement to control encounters.

Use of Force Continuum

Most law enforcement agencies have established policies that guide their use of force. The NIJ provides the following example of a typical use-of-force continuum³:

- **Officer Presence — No force is used. Considered the best way to resolve a situation.**
 - The mere presence of a law enforcement officer works to deter crime or diffuse a situation.
 - Officers' attitudes are professional and nonthreatening.
- **Verbalization — Force is not physical.**
 - Officers issue calm, nonthreatening commands, such as "Let me see your identification and registration."
 - Officers may increase their volume and shorten commands in an attempt to gain compliance. Short commands might include "Stop," or "Don't move."
- **Empty-Hand Control — Officers use bodily force to gain control of a situation.**
 - *Soft technique.* Officers use grabs, holds and joint locks to restrain an individual.
 - *Hard technique.* Officers use punches and kicks to an individual.
- **Less-Lethal Methods — Officers use less-lethal technologies to gain control of a situation.**
 - *Blunt impact.* Officers may use a baton or projectile to immobilize a combative person.
 - *Chemical.* Officers may use chemical sprays or projectiles embedded with chemicals to an individual (e.g., pepper spray).
 - *Conducted Energy Devices (CEDs).* Officers may use CEDs to immobilize an individual. CEDs discharge a high-voltage, low-amperage jolt of electricity at a distance.
- **Lethal Force — Officers use lethal weapons to gain control of a situation. Should only be used if a suspect poses a serious threat to the officer or another individual.**
 - Officers use deadly weapons such as firearms to stop an individual's actions.

In this paper we use CEW (conducted energy weapon) and CED (conducted energy device) interchangeably. Many agencies employ charts to depict this continuum. The following chart sourced from the Philadelphia Police Department is just one of many such charts:



Most law enforcement agencies have additional and extensive policies on which, when and how to use less-lethal devices available to their officers and intensive training is employed to reinforce these policies. And as clearly understood by those experienced in enforcement encounters there is a glaring gap between verbalization and empty-hand control in situations where the officer is not or does not desire to be in grabbing or touching distance of a person but also does not need or wish to use less-lethal weapons.

Consequences of Use of Force

Law enforcement considers use of force in a range of police-citizen encounters. The three tiers of police-citizen encounters include consensual encounters, investigative detentions and arrests. Consensual encounters are the most frequent interaction and seldom involve any use of force. Generally restraint in this situation would not be a consensual encounter. An investigative detention or “Terry stop” is less than an arrest but can involve restraint of a citizen’s movement. While reasonable suspicion is required restraint and reasonable compliance force may be employed. Arrests also allow restraint and reasonable compliance force.

According to the DOJ from 2002 to 2011 an annual average of 44 million U.S. residents age 16 or older - - about 19% of all persons of this age - - had at least one face-to-face contact with a police officer. About 1.6% or 715,500 involved threats of or use of force⁴. And about 1.3 million were handcuffed during their encounter with police in 2002⁵.

Studies have concluded that many police officers never deploy lethal force in the course of their careers in police-citizen encounters. While the vast majority of law enforcement officers around the world are armed with firearms, only a small percentage actually ever use them. Officers however use less-lethal force on a regular basis. The NIJ stated in 2010 that previous studies showed that 1 to 2 percent of police-citizen contacts involve the threat or application of physical force by the police, while 15 to 20 percent of arrests may result in the use of force by police to control a resistant suspect⁶. Most applications of force are low level, however, and involve the use of an officer's hands, arms, and body to push or pull against a suspect to gain control. And suspects are increasingly resistive to hand control by law enforcement. And of course a large number of law enforcement encounters are captured on media either by body cameras or the public.

After verbalization and empty hand control, less-lethal force can range from the use of a baton, chemical spray, CEW or other comparable means to control a subject that is actively resisting the officer. Research published in 2011 by the United States Department of Justice entitled *Police Use of Force, Tasers and Other Less-Lethal Weapons*⁷ reported findings including:

- Injury rates vary widely when officers use force in general, ranging from 17% to 64% for citizens and 10% to 20% for officers (the cost of these injuries affects agencies budgets).
- Use of CEWs can reduce the statistical rate of injury to suspects and officers who might otherwise be involved in more direct, physical conflict.
- A review of fatal Taser incidents found that many involved multiple uses of the device against the suspect in question.
- According to surveys of police departments, rules regarding Taser use vary widely. Six of every ten departments allow "for CEW use against a subject who tenses and pulls when the officer tries to handcuff him or her."
- CEWs are "rapidly overtaking other force alternatives" among police departments and in some cases are being used at a rate that exceeds that of officers using "soft empty hand tactics," or simple pushing or grappling with resistant suspects.
- Overall, the growing use of CEWs is cause for concern: "Although the injury findings suggest that substituting CEWs for physical control tactics may be useful, their ease of use and popularity among officers raise the specter of overuse."

This research points out the need for a use of force tool before or between "soft empty hand tactics" and other less-lethal device deployment.

CEWs and OC spray weapons are not painless or risk-free. CEW barbs often cause small punctures or superficial burns, and OC spray causes an intense burning sensation and irritation of the skin and mucous membranes. In very rare cases, people have died after being pepper sprayed or shocked with a CEW and accordingly CEW deployment is increasingly controversial.

Even traditional tactics such as using a control hold, baton, club, or physical combat to control a suspect may result not only in a significant risk of injury to the suspect, but also a significant risk that the officer will be injured.

Each weapon available to law enforcement has distinct advantages and disadvantages, and law enforcement agencies require different tools for different situations.

The NIJ⁸ describes seven types of less-lethal device technologies:

- **Conducted Energy Devices.** Some CEDs, such as the Taser, can induce involuntary muscle contractions that temporarily incapacitate people. Others deter an individual from a course of action. These include stun guns and stun belts.
- **Directed energy devices.** This technology uses radiated energy to achieve the same effect as blunt force, but has a lower probability of injury.
- **Chemicals.** These chemicals include pepper spray (also known as OC — oleoresin capsicum), tear gas and stink bombs.
- **Distraction.** This equipment temporarily incapacitates people while causing little harm. Examples include the laser dazzler, bright lights and noise.
- **Vehicle-stopping technology.** This equipment can stop cars during high-speed chases.
- **Barriers.** These include nets, foams and physical barriers.
- **Blunt force.** Projectiles used in crowd-control deter people from a course of action.

While there is a wide range of field use of CEWs by law enforcement the average device is used about 0.5 to 1.0 times per year (generally ranging from 0.2 to 1.8 depending on deployment levels within departments and other factors). And there are an estimated 400,000 CEW devices in active deployment⁹.

There is a clear need for an additional tool before pain compliance, electrical induced incapacitation or lethal force is applied to remotely subdue an individual that is actively resisting or evading arrest or to bring an unlawful situation under control. An effective remote restraint device could protect the public and the officer and make encounters less dangerous for both law enforcement and individuals reducing the frequency where use of a CEW is needed.

Since the 1994 introduction of the Taser CEW device there has been no significant adoption of an effective use of force tool for individual officer use in spite of the controversies surrounding CEW use.

Use of Force is a Critical Issue – New Concepts

In an important report entitled “Guiding Principles on Use of Force” published in 2016 by the Police Executive Research Forum (PERF)¹⁰ a number of significant points were made culminating from 18 months of research, field work and national discussions on police use of force, especially in situations involving persons with mental illness and cases where subjects did not have firearms. The report stated, “In 2016, no issue is of greater consequence to the policing profession, or to the communities we serve, than the issue of police use of force. Beginning in the summer of 2014 and continuing over the past year

and a half, our nation has seen a series of controversial cases, many of them captured on videos taken by the police, bystanders, or nearby security cameras.”

The report focused on two types of police encounters:

- With subjects who have a mental illness, a developmental disability, a condition such as autism, a drug addiction, or another condition that can cause them to behave erratically or threateningly; and
- With subjects who either are unarmed, or are armed with a knife, a baseball bat, rocks, or other weapons, but not a firearm.

The report identified significant potential for reducing use of force while increasing officer safety.

The report challenges traditional thinking on use of force, especially in such situations, stating that concepts such as use-of-force continuums, the so-called 21-foot rule and the idea of needing to resolve situations as quickly as possible. In short, the report challenges policing to move to a higher standard when it comes to how and when officers use force in situations where they and the public are not threatened with firearms. The goal is to make policing safer for officers and the public they serve and aid to restore public trust.

The report cited statistics for 2015 including:

- In approximately 25 percent of the 990 fatal officer-involved shootings in 2015, the subject displayed signs of mental illness.
- In 16 percent of the cases, the subject was armed with a knife.
- In 9 percent, the subject was unarmed.
- In 5 percent, the subject was “armed” with a vehicle.

The report focused on the potential for de-escalation and resolving encounters by means other than the use of deadly force. Finally the report presented 30 Guiding Principles on Use of Force that are designed to provide officers with guidance and options, and to reduce unnecessary uses of force in situations that do not involve suspects armed with firearms. Since four of the principles pertain to equipment the issue of a new restraint device could be a significant tool for this new thinking on use of force.

BolaWrap 100 Device Description

The BolaWrap™ 100 is a hand-held remote restraint tool that discharges an eight-foot bola style Kevlar® tether to effectively entangle an individual at a range of 5-25 feet. Designed in cooperation with law enforcement, the small but powerful BolaWrap 100 safely offers an additional tool for law enforcement encounters allowing for a better chance of encounter control, reducing the incidence of and need for injurious uses of force. Other non-lethal devices rely on “pain compliance” often escalating encounters (creating “fight or flight” scenarios) with significant potential for injury. BolaWrap 100 provides law enforcement an effective new tool to safely engage individuals at a distance.



Figure 1

The small, light but rugged BolaWrap 100 is designed for weak hand operation to provide effective remote restraint while all other use of force continuum options remain open. The design provides a wide latitude of accuracy to engage and restrain individuals without pain or uncontrolled falls. Quick eject and rapid reload of bola cartridges allows one device to be reused in a single encounter or in multiple encounters.

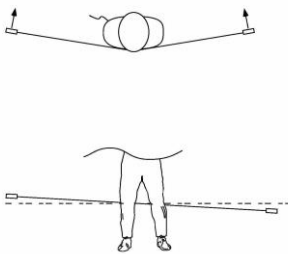


Figure 2

The bola cartridge contains two sockets that discharge two small harmless pellets at a thirty degree angle. The pellets are linked by the eight-foot Kevlar tether such that the tether first engages an individual's legs then the force of the pellets causes the tether to wrap. Small barbs on each pellet engage clothing to retard the unwinding of the bola tether wrap. The bola cartridge contains a 9 mm fractional charge blank cartridge (as used in prop guns) to discharge the tether.

The durable body of the BolaWrap 100 contains a receptacle for the bola cartridge along with the cocking, firing and safety mechanisms. Bola cartridges are quickly ejected allowing rapid reloading, cocking and firing.

Law Enforcement Use Cases

The BolaWrap 100 was inspired by law enforcement professionals request for a tool to reduce the need and incident of use of force options that can result in injury or death. There are limited effective options for remote engagement so when verbal commands go unheeded law enforcement is faced with either hands on engagement or other potentially injurious less lethal or lethal force. The BolaWrap 100 is an additional tool to aid in remote detaining or impeding subjects as part of law enforcement engagement.

The BolaWrap 100 is intended as a tool to impede flight by engaging the legs of a subject. This subject engagement can also protect the surrounding public and the officer from injury.

Primary use cases fall into the two broad categories often encountered:

- Remotely retain and limit the mobility of an individual attempting to evade arrest or questioning. Individuals increasingly ignore law enforcement verbal commands.
- Assist in subduing individuals actively resisting arrest by limiting mobility making other engagement options less risky to officers and less injurious to individuals and the public.

The goal of the device is to assist law enforcement to control encounters and reduce the need for use of force weapons that inflict pain, electrical induced incapacitation, injury or death. The following discussion identifies and documents some primary use cases. But at the same time, as a weak-hand tool, law enforcement is not precluded from other use of force options (including CEW, firearms, etc.) necessary to protect themselves and the public in the performance of their duties. It is not intended to replace other law enforcement weapons although it is desired to reduce the incidence of uses of force both less lethal and lethal.

The BolaWrap 100 is a moderate force tool. It is not intended as a weapon. Wrist and leg lock devices are examples of closer range equivalent purpose tools employed by law enforcement but put law enforcement in contact and in greater danger with individuals. Other moderate force options require close proximity or physical contact.

The BolaWrap 100 has limited utility for and is not intended for the general public. Due to the requirement for the Bola tether to expand outward to effectively engage, use in close enclosed quarters (e.g. homes, narrow hallways, etc.) is not generally effective. The use case need for the public to impede or restrain another person in open areas is very limited unlike law enforcement that engages with subjects in such situations routinely.

CEW Overuse and Misuse Controversy

The BolaWrap is not intended to replace other tools, devices or techniques employed by law enforcement. However the controversy over law enforcement use of other less-lethal devices, especially CEWs, is a factor driving the need for new tools and approaches to control encounters with the public.

While manufacturers dispute the issue of CEW related deaths with studies showing no risk of cardiac arrest, the use of CEWs is nonetheless very controversial. In 2011 the New York Civil Liberties Union¹¹ reported on CEW overuse and misuse suggesting that about 60% of CEW incident reports did not meet the criteria for use with 15% of those cases being clearly inappropriate. They reported that unarmed and nonaggressive subjects were frequently shot with CEW weapons and some suspects were only verbally noncompliant. Further in 40 percent of the cases, CEWs were used against at-risk subjects like children, the elderly, the mentally ill, the physically infirm or subjects that were drunk. In 30% of those cases, the subject was mentally disturbed and was involved in no criminal activity at the time. In most cases the police officers are not to blame as they face very difficult real life situations and have limited tools available to protect themselves and the public.

While there are counter arguments in most CEW death cases, many medical examiners label CEW related deaths as due to “excited delirium” a term which serves as a diagnostic cover-all for situations in which an individual dies mysteriously while in a highly agitated state.

The current state of CEW policy in the US is convoluted and scattered and remains controversial. Individual agencies and departments formulate their own CEW use standards. Again, the police have few good options to deal with non-compliance, control encounters and to de-escalate volatile situations.

National Survey on Less-Lethal Deployment – Use Scenarios

In 2010 a Police Executive Research Forum¹² reported on a national survey on the deployment of less-lethal technologies. As a part of this survey, 518 responding agencies were asked on the use of the following less-lethal technologies in five different use scenarios:

- Soft empty-hand tactics/control
- Hard empty-hand tactics/strikes/punches
- OC spray, foam, or other chemical weapons
- Baton (collapsible, straight, side handle, etc.)
- CEW

The example scenarios surveyed were:

- A. When told by the officer that he is under arrest, the suspect sits down on the ground, hands clearly visible. He silently refuses repeated commands to get up or to place his hands behind his back. His only statement to the officer is “I don’t want to go to jail.”
- B. When told by the officer that he is under arrest, the suspect initially cooperates, but when the officer grasps his wrists to guide his hands behind his back, he tenses his arms and refuses to comply with the officer’s orders to stop resisting. He continues to tense and pull against the officer for 15-20 seconds.
- C. When told by the officer that he is under arrest, the suspect immediately turns and starts to run away. The officer begins to chase him and quickly closes the gap between himself and the suspect. When the officer and suspect are 12 feet apart, the suspect slows down and looks over his shoulder, but does not stop running.
- D. When told by the officer that he is under arrest, the suspect states ‘I’m not going to jail’ and faces off against the officer with his hands raised in a “boxer’s stance.”
- E. When told by the officer that he is under arrest, the suspect swings at the officer’s head with a closed fist. The officer dodges the blow and backs away, but the suspect continues to advance towards him with his fist raised.

The surveys indicated what use of force would be authorized by the reporting agency in each situation. CEW was authorized for use by the reporting agency in each situation as follows:

- A. 30% authorized use of CEW
- B. 65% authorized use of CEW
- C. 74% authorized use of CEW
- D. 95% authorized use of CEW
- E. 97% authorized use of CEW

While each encounter situation is unique and does not fit a textbook pattern, we believe the BolaWrap 100 would have utility in Situations C and D. Depending on the circumstances perhaps also Scenario E. And use of BolaWrap 100 could serve as an alternative to employing CEW in these scenarios. But in each situation the use of BolaWrap 100 would not preclude use of other use of force options should they be required.

The preference of officers to engage at a distance before hand-to-hand engagement is understandable to protect the public, reduce injuries and reduce claims. BolaWrap 100 is an additional tool to engage at a distance making follow-on hand-to-hand engagement safer.

Other Bola Wrap Use Case Scenarios

While each officer encounter is unique there are many use cases where the BolaWrap 100 could have special utility, especially when weak hand use maintains the ability to use all other options.

Suspects With Knife - - This use case is difficult for either CEW or lethal force. These situations pose serious threat to an officer and the surrounding public requiring officers to maintain distance. But these cases are often the most controversial when lethal force is used. One or more entanglements with BolaWrap 100 has the potential to de-escalate many of these types of situations.

Use Case - - the December 7, 2016 tragic shooting of a special needs high school student in Reno, Nevada by campus security (<http://www.rgj.com/story/news/crime/2016/12/07/police-scanner-indicates-officer-involved-shooting-hug-high/95101402/>). The student was wielding a knife and it is very possible that BolaWrap 100 restraint could have prevented this shooting alleged to protect other students.

Drugs - - Attempts to arrest or retain persons on drugs are difficult officer encounters. Often not armed but potentially very violent, these persons often act in unpredictable manners. CEWs are frequently not a good option. BolaWrap to retard movement and flight could be an added tool to other use of force actions in these situations.

Use Case - - The 30-year-old Virginia man who died March 30, 2015 following an altercation with local police during which he was shocked with a CEW, possibly multiple times, experienced an abnormal heart rhythm due to PCP use, severe stress and the electroshock use, all of which contributed to his death, according to the chief medical examiner.

High School Drug Controversial CEW Use - - March 1, 2017 a Suffolk county officer is under investigation for using a CEW on a 16 year old high school student on campus. The student was attempting to flee, was tased and arrested and the engagement was captured on cell phone videos broadcast widely. <http://newyork.cbslocal.com/2017/03/02/copiague-taser-incident/>

Border Patrol Apprehensions - - Border patrol agents are routinely involved in retaining individuals. This is often as a result of pursuit and often in open spaces. Foot chases offer few alternatives other than CEW or firearms that are deployed but in most cases with controversy. The BolaWrap 100 offers border patrol agents and alternative engagement tool.

One Year Analysis of Shooting Deaths (Original Research)

The arrest-related death (ARD) is a phenomenon that occurs about 800 times per year in North America. This number is estimated from a population-based adjustment from the 700 annual ARDs found in the 47 reporting states of the USA¹³. While these lethal encounters are a very small percentage of police encounters in general or even encounters involving use of force they are important in not only the cost of life but also the emotional, social and economic costs (see discussion below).

While the previous discussion focused mostly on applications of the BolaWrap 100 in less-lethal encounter situations (the most common use case), this field analysis focuses on lethal encounters and reduction or prevention that could possibly have resulted from deployment of the BolaWrap 100. Many lethal situations involve officers facing armed suspects and any form of restraint or less-lethal response is normally unwarranted, however there are still situations that could possibly be remotely controlled or de-escalated before the need to apply lethal force. This is the subject of this filed analysis.

Based on our knowledge of the capabilities of the BolaWrap 100 we performed a subjective analysis of 1,175 events in the last twelve months (March 2016 through February 2017) resulting in a police killing of another person sourced from “killedbypolice.net”¹⁴. A percentage (estimated by authors at 10% or so) of these are the result of accidents or vehicle killings and not a suspect encounter or police shooting. But this site links to media reports with information allowing us to subjectively analyze the encounter after the fact.

While significant judgment was employed based on our knowledge and experience in testing the BolaWrap 100, the following factors guided our analysis of each encounter:

- Suspect armed - - if the suspect was armed with a firearm and pulled the firearm on the officer then this would be an obvious exception and not a possible remote restraint use case.
- Suspect location -- if the suspect was in a vehicle or barricaded and not capable of having a bola applied this would be an exception.

The following table summarizes our subjective analysis of encounters:

Month	Total Killings by Officer Analyzed	Situations Where BolaWrap 100 May Have Been Deployed
February 2017	112	26
January 2017	105	30
December 2016	90	22
November 2016	96	32
October 2016	94	18
September 2016	86	21
August 2016	101	22
July 2016	96	22
June 2016	103	21
May 2016	98	25

April 2016	91	24
March 2016	103	23
TOTAL	1,175	286

Overall an estimated 24% of lethal situations over the last twelve months based on this analysis had the potential for BolaWrap to be deployed. This percentage would increase if the estimated 10% of killings resulting from accidents or vehicles not involving suspect encounter were excluded.

If a remote restraint device such as the BolaWrap 100 were available, the law enforcement officer(s) on the scene would determine when and if to deploy BolaWrap. While it is difficult to determine if deployment would have precluded the ultimate use of lethal force it is important to note that the weak-hand deployment does not preclude any other options. And the consequences and costs of even a few preventions could justify deployment of the tool.

A couple of examples from this field analysis are included below to illustrate events included in this analysis:

Example1

Terrence Crutcher walked around street for several minutes and was ordered multiple times to put hands up, didn't comply ultimately reaching into an SUV. One officer used a CEW at the man another officer fired one shot.

http://www.tulsaworld.com/news/crimewatch/update-attorney-calls-for-release-of-video-in-fatal-shooting/article_1752269b-eab4-5182-8dcf-c024a198757f.html

Example 2

Ariel Garza - A distraught man menaced officers with bottle. CEW use was ineffective and a second CEW caused cardiac arrest. \$10 million lawsuit against city.

<http://www.nydailynews.com/new-york/bronx/man-critical-condition-cops-taser-bronx-clash-article-1.2855934>

We noted a number of situations where it may be possible to control an encounter before escalation. But again, each department is expected to determine when and how to deploy a restraint tool such as the BolaWrap 100.

Emotional, Social and Economic Aspects

Emotional

When officers are in a life threatening situation they not only must deal with surviving and maintaining their basic integrity, but they have to be concerned with the department's reaction, the community's reaction, and the media's reaction. Officer-involved shootings or even less-lethal weapon use can trigger the "am I going to be fired or going to prison?" reaction causing tremendous stress. Most officers manifest a degree of guilt or anger after a shooting confrontation no matter how justified they are found to be.

"Police work is a high stress occupation. It affects, shapes, and at times, scars the individuals and families involved." (Axelbred and Valle's 1978¹⁵), statement "police work has been identified as the most

psychologically dangerous job in the world" (Eisenberg 1975¹⁶). When officers are forced to employ deadly force, no matter how justified they are found to be, most officers manifest a degree of guilt or anger after a fatal confrontation. Police psychologists have labeled the emotional problems that frequently occur "post-shooting trauma". A study by E. Nielson¹⁷ in 1981 showed that 92% of officers experienced physiological symptoms with nausea being most common and 52% reported depression as the most frequent psychological symptoms.

Social

During the past year, the United States has experienced major social controversies-and civil unrest-regarding police violence and police deaths. Turning anger to action, the growing social movements such as Black Lives Matter have focused public attention on both lethal and non-lethal force. At issue are not only the direct harms to individuals but also the toll taken on family members and communities, both for persons killed by police and for police killed in the line of duty. A related social aspect is the effect violence has on the community through policing and governance.

Economic

The economic costs of violence are documented by variety of studies. A police killing or injury has immediate direct costs of coroner/autopsy, hospital/trauma and longer costs of lost wages and legal costs/settlements. The legal claims and settlements of even less-lethal stunning are often in the hundreds of thousands of dollars.

A July 2015 WSJ¹⁸ article indicated that just the 10 cities with the largest police departments paid out \$248.7 million in 2014 in settlements and court judgments in police-misconduct cases, up 48% from \$168.3 million in 2010. Those cities collectively paid out \$1.02 billion over those five years in such cases, which include alleged beatings, shootings and wrongful imprisonment. When claims related to car collisions, property damage and other police incidents are included, the total rose to more than \$1.4 billion.

Any reduction of police incidents from use of an additional tool such as the BolaWrap provides a significant benefit to department and government budgets.

Conclusion

This white paper describes the need for a remote entanglement restraint as a police use of force tool and the limitations of existing use of force techniques and less-lethal device alternatives. No effective new tool has been introduced broadly to police since the 1994 introduction of the Taser CEW device. And there is a clear gap in engaging with suspects before and after hand control and the need and desire to reduce the incidence of CEW use.

The original research conducted by the authors on 12 months of police killings supports the data described in PERF's "Guiding Principles on Use of Force" (see page 5 above) that new methods, approaches and tools should be used in a significant percentage of deadly encounters. That report showed that in 25% of the cases the suspect was armed with a knife or unarmed. This is consistent with the authors' analysis of 12-month lethal case data wherein the BolaWrap 100 could have possibly had a use in 24% of such cases analyzed. And the thousands of daily encounters involving use of force that do not escalate to a deadly event offer additional opportunities to reduce the need for more aggressive policing and injuries to police and the public they serve.

The authors conclude and believe an effective entanglement device has the potential assist law enforcement to control a large number of encounters to reduce the need for other less-lethal or lethal deployments reducing the emotional, social and economic toll on society.

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