ambushes of police:

ENVIRONMENT, INCIDENT DYNAMICS, AND THE AFTERMATH OF SURPRISE ATTACKS AGAINST LAW ENFORCEMENT

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Letter from the Director of the COPS Office

Dear colleagues,

Every day, law enforcement officers serve this great nation with distinction by protecting all of us from harm. That protection, however, comes at great risk to the men and women who courageously don the uniform and wear the badge. Too many times each year we bear witness to the tragic murder of a police officer or deputy in the line of duty. We are outraged by the heinous act of the perpetrator and inspired by the selfless acts of the lost hero. Yet we often fail to take into consideration the long-term effects such exposure to risks can have on our public safety officers.

We know that the murder of a police officer in the line of duty is an assault on the entire community. However, when that murder is a result of an ambush, it also attacks the very foundation of our democracy.

In the words of President Obama, this is totally unacceptable. And we must act to address this persistent threat.

This ambush report is an important first step. Compiled by CNA and the International Association of Chiefs of Police (IACP), it investigates methods for preventing, responding to, and surviving ambushes.

In addressing these threats, it reflects a core value of the U.S. Department of Justice: The health and safety of American law enforcement officers, which is not only our obligation to those who risk their lives for us but also critical to the safety of us all.

Officer Safety and Wellness is also a high priority for President Obama and a pillar of the Final Report of the President's Task Force on 21st Century Policing. In its recommendations, the task force underscored the fact that efforts to support the mental and physical well-being of officers do not conflict with police reform but contribute to it.

Noting this in a recent address, Attorney General Loretta Lynch said that the U.S. Department of Justice stands not only with law enforcement but also "with every community member, police and civilian alike, as they all work towards a safer community for us all. This violence against all of us—regardless of what uniform any of us wears—has to end."

I thank all of the individuals at the COPS Office, CNA, and the IACP who have contributed to this very valuable report. The safety of our law enforcement professionals is paramount; every loss is a tragedy that we must strive to prevent, and it is our great hope that this report will help do so. In the words of Attorney General Lynch, "Our hearts are broken over this."

Sincerely,

Ronald L. Davis
Director
Office of Community Oriented Policing Services

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We also wish to acknowledge our colleagues at CNA. CNA Research Scientist Angie De Groot led our focus groups for this project, and Senior Law Enforcement Fellow Chips Stewart was very supportive and encouraging of our work over the duration of this project. His passion for helping law enforcement inspired this research topic.

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Executive Summary

Ambush attacks against law enforcement officers remain a threat to officer safety, with the number of attacks per year holding steady since a decline in the early 1990s and the proportion of fatal attacks on officers attributable to ambushes increasing. Concerns about targeted violence against police are on the rise, while officers must not only be guardians of the public but also be prepared to respond to violence targeting them.

In an era of strained community relations and struggles with police legitimacy, violence against police is of particular concern. Yet little research has examined ambush attacks as a specific and particularly directed form of violence against police. The current study addresses that gap in the research literature through a mixed-methods study of ambush attacks against law enforcement.

This report includes a literature review of extant research on the topic of ambushes against police specifically and violence against police more generally. This area of research remains understudied. Only a few national studies have been completed, and there have been only a handful of studies focused specifically on ambushes. This study includes the first comprehensive set of analyses conducted on the topic of ambushes in more than two decades. This report details findings from four inquiries on the topic:

1. A series of focus groups with police leaders to discuss ambushes, including definitional issues, preparation and protection strategies, and recovery after ambush incidents.
2. A quantitative analysis of environmental (agency and jurisdictional) characteristics associated with increases in the number of ambushes experienced by agencies over a five-year period.
3. A quantitative analysis of ambush incident survivability rates associated with officer, suspect, and incident characteristics.
4. A qualitative and quantitative analysis of organizational learning in the wake of ambush incidents based on survey data collected as part of this study.

The findings from these lines of inquiry provide a staging ground for future research as well as recommendations to support practitioners and researchers alike in better understanding ambushes against police officers. First, data collection methods must be improved and standardized to allow for a better understanding of national trends in ambushes of law enforcement officers. Second, more research is needed to assess the impact of law enforcement practices and operations on violence against the police. Numerous aspects of police practices and operations have the potential to impact the likelihood of violence against the police as well as the outcomes when violence does take place. More study is required to identify and quantify those impacts.

Introduction

This report addresses a critical need in the law enforcement community: systematically derived, empirical knowledge about acts of extreme violence against the police, specifically ambushes. It does so at a time when police tactics and use of force are under greater scrutiny than at any other time in the history of policing. A culture in policing that has traditionally valued hard chargers, machismo, and a warrior mindset (see Conti 2011; Herbert 1998; Herbert 2001) is being challenged by leaders in law enforcement, community leaders, advocates, journalists, and researchers alike (see, e.g., Balko 2013; President's Task Force on 21st Century Policing 2015; Rahr and Rice 2015; Stoughton 2015). Today, police reformists and police leaders seek to advance a guardian mindset to counterbalance aggressive police tactics that could potentially damage police-community relations and public safety.

While it is true that police restraint, de-escalation, and communication are paramount to improving police-community relations, we must also acknowledge that the very nature of police work requires officers to respond to some of the most unpredictable, dire, and violent encounters humankind has to offer at the street level. Even on the toughest beats in the toughest neighborhoods, much of an officer's workday may not entail anything more than routine calls for service; but it is no less true that it may entail an act of extreme violence, and officers may find themselves as first responders, investigators, or victims of such violence. In rare circumstances, officers are the targets of violence for what they represent or for actions they intend to take as enforcers of the law.

The research presented in this report is premised on the ideal that officers must not only be guardians of the public but also be prepared to face and respond effectively to violence against themselves and others. Just as de-escalation and a guardian mindset is paramount today, so is officer safety. To quote the President's Task Force on 21st Century Policing (2015, 62),

> The 'bulletproof cop' does not exist. The officers who protect us must also be protected—against incapacitating physical, mental, and emotional health problems as well as against the hazards of their job. Their wellness and safety are crucial for them, their colleagues, and their agencies, as well as the well-being of the communities they serve.

Though a handful of best-practice articles have discussed training, tactics, and descriptive trends regarding ambushes (e.g., Lovette 2011; McDonald 1995; Shannon Meyer and Carroll 2011), the topic of ambushes has not been addressed from a systematic research perspective in more than 20 years (see C. Kenneth Meyer et al. 1986). Yet the landscape of policing, crime, and socie-ty has changed dramatically in that time. In recognition of these changes, the U.S. Department of Justice (DOJ)-funded Officer Safety and Wellness (OSW) working group recently identified building knowledge on ambushes against the police as one of the DOJ's top priorities (Stephens, Fielder, and Edwards 2012).

The goal of this report is to provide an updated empirical foundation for which the law enforcement field can understand ambush assaults. To do so, the authors discussed the topic with law enforcement officials, examined the characteristics and traits of environments and individuals involved in ambushes, and surveyed agencies that have encountered ambushes. This report is intended to demonstrate the current state of knowledge on ambushes of the police and provide new information that can guide police executives, trainers, supervisors, policymakers, and researchers in addressing the issue. Our findings can aid in the development and evaluation of policies and training programs aimed at preventing or improving outcomes of ambush assaults against the police. This report should be considered foundational research upon which the field can build.

Ambush defined

What is an ambush? In uncomplicated terms, an ambush is a planned surprise attack on a human target. That is, the attacker has done some planning and the victim is surprised. In 1974, against the backdrop of increased targeted violence against the police, the International Association of Chiefs of Police (IACP) sought to understand these types of attacks against law enforcement using the following characteristics to define ambushes in relation to law enforcement (IACP 1974):

Suddenness. The attack must be initiated and concluded within a brief period of time; although no specific time parameters were set, the attack would generally last less than 10 minutes.

Surprise. The assailant surprises the officer. This could mean concealing their very presence at the scene of the attack or their motives in an otherwise nonviolent encounter.

Lack of provocation. The attack cannot reasonably be said to have been provoked by the behavior of the officer at the time of the attack.

In a follow-up study to IACP report, researchers (C. Kenneth Meyer et al. 1986) added a defining characteristic of ambushes against the police:

Excessive force. The force used by the assailant exceeds what would be expected by the officer given the circumstances of the incident and the level of force used by the officer.

Table 1 on page 3 summarizes these characteristics.

Table 1. Characteristics of an ambush

Characteristic	Description
Suddenness	Assault is executed quickly
Surprise	Assailant or motive is concealed
Lack of provocation	Officer actions are routine and non-threatening
Excessive force	Assailant actions exceed officer's at the onset of the attack

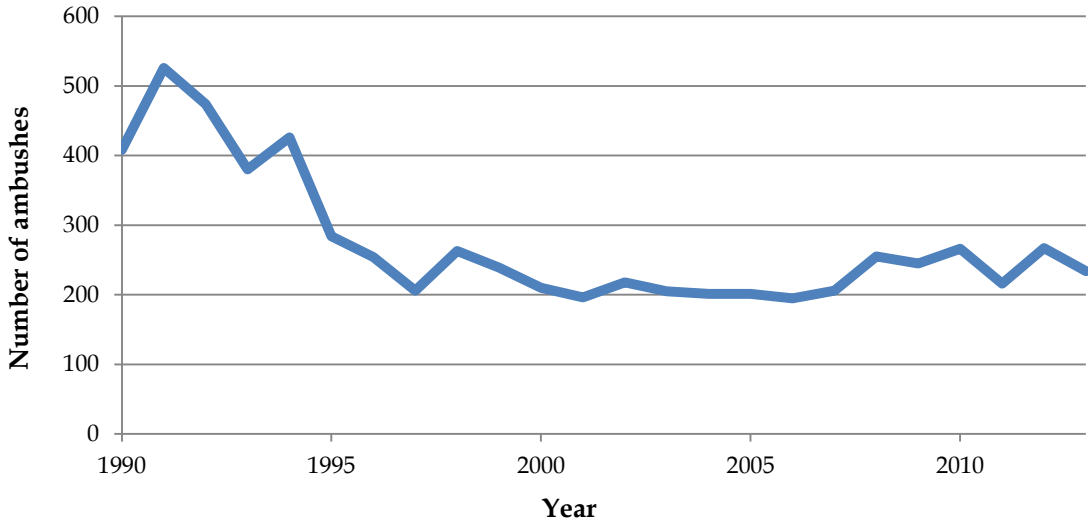
Within these general parameters, a typology has emerged that categorizes ambushes either as entrapment or as a spontaneous attack (see Federal Bureau of Investigation 2013; C. Kenneth Meyer et al. 1986). Entrapment ambushes are premeditated and what some may consider a more traditional conceptualization of an ambush, in which the assailant purposely lures an officer into a trap and executes the assault—sometimes from a position of physical concealment. Spontaneous ambushes are unprovoked attacks without long-term, methodical planning. These types of attacks may be considered crimes of opportunity, in which the assailant makes the decision at the time of the officer's approach or at some point during their interaction when the officer would not expect an attack. It should be noted that ambushes can be fatal or nonfatal incidents and do not necessarily involve firearms or weapons at all.

The parameters and typology that help define these dynamic, violent encounters are imperfect. A series of focus groups organized for this study illustrates this point in chapter 2. The focus groups uncovered a lack of consensus as to what constitutes an ambush. It is important to note that this lack of consensus may contribute to fluctuations in reporting practices that are not reflective of actual ambushes but rather of perceptions, opinions, and nomenclature. The OSW working group similarly concluded that a recent increase in ambushes of the police may reflect changes in reporting practices rather than changes in incidents (Stephens, Fielder, and Edwards 2012).

However, the characteristics described thus far present the only existing framework for understanding, documenting, and measuring these types of attacks against the police. The FBI's Law Enforcement Officer Killed and Assaulted (LEOKA) program has used this framework to collect data on police ambushes for more than two decades. Examining this data from the past 25 years shows that, like crime, reported ambush attacks against the police have decreased, falling steadily throughout the 1990s and remaining at a level of approximately 200 ambushes per year for the 2000s. This figure includes ambushes that were fatal, injurious, and noninjurious, as well as ambushes involving firearms, sharp objects, blunt objects, and personal weapons (e.g., hands and feet). Of these ambushes, 36 percent were committed with a firearm, 35 percent with hands, 26 percent with some other weapon (blunt object, vehicle, etc.), and 3 percent with a knife or

other sharp object. In the late 2000s and early 2010s, the number of ambush attacks against police officers trended slightly higher, as have concerns in the law enforcement community. Figure 1 illustrates the trend from 1990 through 2013.[1]

Figure 1. Ambushes of law enforcement officers, 1990–2013



Source: Data from LEOKA

It is important to note that these ambush counts drawn from the LEOKA database may not fully reflect the rate of ambush occurrences in the nation. Examination of the LEOKA data collection instrument shows that "ambush" is not clearly defined and that each assault can be classified into only one situational subcategory (e.g., ambush, interaction with mentally ill subject, or traffic stop). Thus, it is not possible to know the true count of ambushes during the time period examined nor whether individual agencies used the same or similar methods to define ambushes as opposed to other assaults. Our findings should be understood within these important constraints.

1. It is important to note here and throughout this report that LEOKA counts officer-victims as the "unit" of assaults and ambushes; therefore, the numbers reported are not the number of ambush incidents but rather the number of officers targeted by ambushes, and one attack may result in several victims.

About this report

Each chapter of this report presents a perspective on ambush attacks through a research lens, using original and existing data on the topic. The mix of methods used includes surveys, focus groups, and quantitative analyses, each of which is described within the chapters to follow. **Chapter 1** provides a literature review drawing largely from the research on assaults against officers, felonious deaths, and officer-involved shootings. **Chapter 2** presents the perspectives of police leaders, who discussed the topic with the researchers in a series of focus groups at the IACP Convention and Expo in October 2013. **Chapter 3** presents a police agency-level analysis examining the correlates of organizational and community characteristics on the prevalence of ambushes. More than 800 police agencies and five years' worth of data are used to examine this issue. **Chapter 4** presents an incident-level analysis examining officer and suspect characteristics, incident dynamics, and their influence on the survivability of an ambush assault. **Chapter 5** presents the results of a survey of police agencies that encountered ambush incidents between 2004 and 2011 and the organizational learning practices that were used in the wake of the attacks. The final chapter concludes this report and provides a series of findings and recommendations for the consideration of police executives, trainers, supervisors, and policymakers.

Chapter 1. Literature Review

Although there has been little research on the topic of ambush assaults against police, there is a richer landscape of knowledge on the broader general issue of violence and the police such as assaults against the police, police use of force, and officer-involved shootings. We draw from this research, as well as the few studies that have addressed ambushes specifically, to frame our current landscape of knowledge on violence involving the police with the understanding that ambushes are a particularly extreme form of violence that may be driven by different factors. Past research has generally considered environmental conditions including community and organizational traits; officer and suspect characteristics; and some incident factors. Most studies have sought to understand the general trends that contribute to these incidents and how various factors influence the likelihood of such incidents occurring in the first place along with the outcomes of these incidents such as injuries and fatalities.

Environments

Research on homicides and assaults of police officers has found relationships between certain environmental characteristics within jurisdictions and these forms of violence against the police. These findings include the following:

- Increased risk of police deaths in drug-related enforcement activities (Mencken, Nolan, and Berhanu 2004)
- Positive correlation between felonious death rates of law enforcement officers and other crime measures (Fridell and Pate 1995)
- Negative correlation between felonious death rates of law enforcement officers and arrest rates (Fridell and Pate 1995)
- Higher rates of felonious deaths of law enforcement officers in Southern states (Boylen and Little 1990; Kaminski, Jefferis, and Gu 2003; IACP 1974; Fridell and Pate 1995)

Some studies (Hirschel, Dean, and Lumb 1994; IACP 1974; Kaminski and Sorenson 1995; Laura Ann Wilson and Meyer 1991) describe the times and circumstances most commonly associated with assaults of police) with the major finding being that, despite conventional wisdom, domestic violence incidents do not carry the highest risk of assaults or injuries to responding officers. The large number of officers assaulted and injured during domestic violence calls was primarily due to the frequency of such calls. In other words, a lot of officers are injured in domestic violence calls, but that is because there are simply a lot of domestic violence calls.

Three research studies on violence against police officers provide context for this analysis, because they focused on environmental factors related to violence against police. Research on the criminogenic environments of micro-places in Boston, Massachusetts, found that neighborhoods with low socioeconomic status measures (e.g., residential stability or economic

distress) also experienced higher rates of assaults against the police (Kaminski, Jefferis, and Gu 2003). The authors also found strong correlation between higher arrest counts and violent crime counts and higher rates of assaults against police. (Kaminski, Jefferis, and Gu 2003.) Steve Wilson and Zhao (2008) examined the influence of organizational factors on injurious assaults against the police, juxtaposing community policing and aggressive enforcement activities. The researchers found that meeting with community groups on a regular basis significantly predicted lower rates of injurious assaults against officers. Aggressive drug enforcement, on the other hand, was strongly related to higher levels of injurious assaults. Fridell and colleagues (2009) examined both community and organizational factors, finding that agencies that promoted body armor use experienced higher levels of violence against their officers, that violent crime rates were positively associated with levels of violence against the police, and that greater internal scrutiny of use of force was associated with lower levels of violence against the police.

Officers

Previous research indicates that officer characteristics may play some role, though not a large one, in line-of-duty assaults, injuries, and felonious deaths. Officers' base physical characteristics, age, experience, and skills have been common points of inquiry in understanding the prevalence and outcomes of violent encounters.

In one of the earliest studies on the topic, researchers found that officers' physical stature did not impact their likelihood of being assaulted (Chapman, Swanson, and Meyer 1974). In other words, smaller officers were not more attractive targets, contrary to conventional wisdom at the time. However, officers with exceptional physical features, particularly height, may be more likely to be injured if they are assaulted (Kaminski and Sorenson 1995). No studies have accounted for other aspects of officer physicality or general health that may prove advantageous in an assault situation, such as stamina, speed, or strength.

Officers involved in violent encounters, whether in officer-involved shootings or in assaults against police, have often been found to be older than the suspects (Fachner and Carter 2015; C. Kenneth Meyer et al. 1986) though not older than their peers (Fachner and Carter 2015). But such officers' age and experience as a group is likely related to their being in a patrol function, where they are more likely to be interacting with the public and therefore more likely to be assaulted or involved in a shooting (Fachner and Carter 2015; McElvain and Kposowa 2008; C. Kenneth Meyer et al. 1986; Stewart et al. 2012). Though not all patrol officers are young and inexperienced, the young and less experienced officers are mostly on patrol. An analysis of all police killed in the United States between 1995 and 1999 found that 0–4 years of experience and the age range of 30–39 years were particularly deadly for officers as measured by their frequencies among officer

fatalities and compared to deaths of officers at other levels of experience and other age ranges (Tucker-Gail et al. 2010).[2] However, these findings are very limited, because existing databases at the national level do not provide for a meaningful comparison to the experience and age of the average officer on the street. Therefore, the findings from the study cannot speak to the likelihood of an officer's being killed and therefore to the relative risk among groups of officers. Though most officers who were killed were between 30 and 39 years old, the researchers could not say if that was because in fact most officers in the country are 30–39 years old. A study of Baltimore County, Maryland, police agencies examined officer experience and the likelihood of being injured when assaulted and found that the odds of an assault resulting in an injury were greatest for officers with seven to 12 years of experience, uncovering a potential time frame in which officers are most complacent or when tactical defense skills are likely to languish (Kaminski and Sorenson 1995).

Although education, specifically a college degree, has been found to reduce the likelihood of injury to an officer if he or she is assaulted (Kaminski and Sorenson 1995), research does not provide evidence that training can protect officers from assault or death in violent encounters. In a study specifically on ambushes of the police, the recentness of recruit, mechanical (e.g., patrol procedures and investigations), legal, human relations, and leadership-management training were not related to fewer incidents of assaults against officers (Chapman, Swanson, and Meyer 1974). Similarly, academy training and in-service training hours have not been associated with lower rates of felonious killings in police agencies (Fridell and Pate 1995; Kaminski 2002).

But skills and abilities ought to matter whether gained through genetics, experience, or training. Some research is instructive in this regard. For example, officers who are "field independent"—that is, less distracted by irrelevant stimuli—performed significantly better at complex decision making during a violent encounter where external stimuli (specifically noise) were prominent (Vrij, Van Der Steen, and Koppelaar 1995). Using a firearms training simulator (FATS), the researchers found field independent officers were significantly more likely to perform not only primary responses such as engaging the suspect with deadly force but also secondary responses such as taking cover (Vrij, Van Der Steen, and Koppelaar 1995). In a similarly designed study, officers identified as "hardy," meaning they respond well or are impervious to stress, performed better in violent encounters, were less likely to err in judgment and more likely to take cover (Barton, Vrij, and Bull 2004). These findings suggest that police agencies may consider recruiting or training officers to be field independent and hardy, and they may see improvements in officer safety and performance in violent encounters as a result. However such efforts have not be evaluated nor have the research findings been widely replicated.

2. The researchers found that, among five age groups, organized by decades, 34 percent of feloniously killed officers were 30–39 years old; similarly, among eight experience groups, organized by five-year periods, officers with 0–4 years of experience accounted for 36 percent of feloniously killed officers.

Last, in-depth case studies have identified some officer traits that are not easily captured in data collection tools. Researchers in the FBI's Behavioral Science Unit have sought to illuminate some less tangible and less quantifiable characteristics of victim officers in a series of qualitative analyses based on in-depth case studies and cognitive interviews with offenders and officers who survived. According to the researchers, officers were friendly, well-liked, hard-working, and public service-oriented; believed in their ability to read others and situations; and were considered laid-back or easygoing (Federal Bureau of Investigation 1992; Pinizzotto, Davis, and Miller 1997). The researchers also found that cop killers used perceptual shorthand in making their decision to assault the officers, thereby reading nonverbal, unconscious signals and assuming that officers were unprofessional or inattentive (Pinizzotto and Davis 1999). It is interesting that the study of Baltimore police agencies found a substantial number of officers were assaulted multiple times during the study period (Kaminski and Sorenson 1995). But further analysis is needed to understand whether these officers were less skillful or possessed some quality or exhibited behavior that made them more frequent targets of assault. These findings made a case on the perils of complacency and the predatory nature of some violent offenders. However, the research had significant methodological limitations, primarily in the fact that the researchers relied on a small sample size and lacked any comparison groups. While the researchers found that officers were generally described as "friendly" or "well-liked," they did not have any measure of whether a typical officer would be considered friendly or well-liked. Therefore, the implications of these studies should be interpreted with extreme caution.

Assailants

Research on assailants who perpetrate violence against the police has generally shown that, with some exceptions, their personal characteristics do not factor into outcomes, but some assailant characteristics appear to be common. For example, assailants and suspects are often found to be younger than officers (Bannon 1976; Fachner and Carter 2015; C. Kenneth Meyer et al. 1986; Pinizzotto, Davis, and Miller 1997). Examining ambush suspects, researchers found that assailants were disproportionately non-White, male, and unemployed and generally of low socioeconomic status (Chapman et al. 1974; C. Kenneth Meyer et al. 1981). Kaminski (2008) analyzes the characteristics of counties and finds that police were more likely to be murdered in those that were economically depressed, with larger percentages of African Americans and more persons aged between 25 and 34.

Other research foreshadowed today's discussion on procedural justice, violence, and the criminal justice system and found that interactions between officers and assailants shaped perceptions and the likelihood of violence. Through in-depth interviews with assailants of the police, Bannon, 1976 found that the perception of whether the officer was performing his role properly contributed to the assailant's decision to assault. According to Bannon, the officer and

suspect's diverging ideas during the encounter as to whether the appropriate roles were being fulfilled contributed to the ensuing violence, thus providing early evidence of the nexus between procedural justice and violence against the police—a linkage that is yet to be fully explored through research.

Mental illness and police response to it, generally, have garnered much-needed attention in the past two decades with many police agencies employing various models of crisis intervention teams to calls involving persons who are both mentally ill and potentially violent (see Reuland, Draper, and Norton 2010). One important finding is that police responses to calls involving mentally ill subjects rarely become violent; predictors of violence as measured by police use of force are similar to those of all other police encounters, those predictors primarily being suspect resistance and the subject's demeanor (Morabito et al. 2012).

Research on more than 100 years of criminal homicides of New York Police Department (NYPD) officers showed that most assailants were rational robbers, fleeing the scene of a crime, who routinely used potentially lethal weapons as "tools of the trade" (Margarita 1980). This contradicted prevailing myths at the time that police were typically killed in domestic disturbances or by "lunatics." However, a review of 66 police killers in 2013 and 2014 noted that while a majority of the assailants had committed their offenses while actively involved in other crimes, a sizable number of the assailants had exhibited some sort of extremism, mental illness, or state of delirium as the proximate motive (Stone 2015). The mental state of assailants of the police, particularly those who kill the police, may be a more relevant factor today than in years past.

Incident dynamics and tactics

With few exceptions, research suggests that there is little that an individual officer can do to significantly decrease his or her likelihood of being targeted for assault, injury, or death in a violent encounter save for being promoted and moving out of a patrol function. However, other dynamics, tactics, and technologies can prove beneficial or detrimental in increasing preparedness for such attacks and survivability during the attacks. Though not directly related to ambushes, the literature described in this section highlights what is generally known about incident dynamics and tactics in physical altercations between the police and the public.

According to Kaminski (2002), soft body armor may be the biggest contributor to the dramatic decline in police deaths since the 1970s. In addition to body armor, other technologies appear to have improved officer safety and lessened the likelihood of injuries. Evaluations of the use of oleoresin capsicum (OC) spray (Bowling and Gaines 1997; Edwards, Grandfield, and Onnen 1997; Kaminski, Edwards, and Johnson 1998) and electronic control weapons (ECW) (Alpert et al. 2011; Paoline, Terrill, and Ingram 2012; White and Ready 2007) often show that officer and suspect injuries are less likely when officers use these weapons. A recent evaluation on officer tactical decision making, which used a computer simulated environment, found that ECWs may

even significantly reduce the need to use deadly force (Sousa, Ready, and Ault 2010). However, much debate continues regarding the safe, effective, and lawful use of these weapons and their impact on officer decision making in nonviolent and violent encounters (see, e.g., Kaminski et al., 2012; Terrill and Paoline, 2012).

Increased scrutiny of foot pursuits and their impact on officer and community safety has caused police agencies to reconsider policies and practices regarding this tactical response to a fleeing suspect (Kaminski et al. 2012). As noted by Kaminski and colleagues (2012), the conversation around foot pursuits has begun to parallel the history of research and literature on vehicle pursuits, which helped change the dialogue on their appropriateness (Lum and Fachner 2008). Based on research, the policing field now knows that restrictive policies work—they can reduce vehicle pursuits and subsequent accidents and injuries (Alpert et al. 2000). The field is also aware of conditions that significantly increase the likelihood of accidents and injuries, including weather, lighting, traffic, and speed (see Lum and Fachner 2008).

Research and analysis on deadly force incidents gives us information on the impacts of incident dynamics and tactics. Researchers have examined various outcomes, including judgment, speed, shooting accuracy, tactical errors, injuries, and fatalities.

Tactical errors occur often in officer-involved shootings. A recent analysis of officer-involved shootings described 12 common types of errors across all shooting incidents (Stewart et al. 2012). Perhaps most most important was the finding in a follow-up analysis that the number of officers on scene was found to be a significant predictor of tactical errors (Fachner 2015). Specifically, for every additional officer added to the mix, there was an increase in about one-fifth of a tactical error, on average (Fachner, 2015).

When controlling for a host of other incident factors, environmental conditions such as being indoors versus outdoors and the lighting and visibility of the scene have not been shown to significantly impact officers' shooting accuracy (White 2006). Rather, the most prominent factor associated with shooting accuracy was distance; officers were least accurate at further distances and during close physical altercations while being most accurate at middle ranges (White 2006).

Research conducted in a controlled training environment provides perhaps some of the most illuminating findings related to officer tactics and safety in a deadly force encounter. For example, researchers have examined how officers respond to a routine traffic stop when the passenger draws a firearm. They found that officers who approached the vehicle from the passenger's side were able to reach a position of safety significantly faster than those who approached from the driver's side; in addition, the researchers found that officers who waited to draw their firearm until they reached a position of safety (rather than drawing their firearm while tactically retreating) were able to reach that position significantly faster (Lewinski et al. 2013).

Researchers with the Advanced Law Enforcement Rapid Response Training (ALERRT) program at Texas State University have also made innovative use of reality-based training, evaluating the impact of various dynamic room entry techniques and measuring both officers' and suspects' shooting accuracy as one of their outcomes in a series of experiments. The researchers found that the officers' use of lateral movement could inhibit the suspects' shooting accuracy without other significant impact on the officer making entry (Blair and Martaindale 2014).

Although these past experiments were limited by small sample sizes, they represent major innovations in police training, tactics, and evaluation. Our study adds to the literature in this area by investigating officer survivability specifically in ambush situations (see chapter 4).

Summary

Past research has provided a rich foundation for understanding the environments, officers, suspects, and dynamics of violent encounters. Yet critical gaps remain particularly as they relate to ambushes. Ambushes represent a special strain of violence against the police with a potentially different set of challenges for response and protection against such attacks.

To date, the environments in which ambushes take place and the characteristics of the officers, assailants, and incident dynamics have not been brought together into a single comprehensive study. The following chapters explore these issues through the lenses of statistical trends, law enforcement leadership perspectives, and a survey of police agencies that have encountered ambushes.

Chapter 2. Police Leader Perspectives on Ambushes

Introduction

At the 120th annual International Association of Chiefs of Police (IACP) conference in Philadelphia, Pennsylvania, in 2014, CNA and the IACP held three focus group sessions with senior-level law enforcement executives, both active and retired, to gain insight from the field about ambushes. During the sessions, participants explored a variety of ambush topics including how law enforcement agencies define, prepare for, protect against, respond to, and recover from ambush attacks.

Data

Participants. CNA and the IACP collaborated to identify, contact, and confirm participants for the focus groups. A total of 17 officials participated in the three sessions. Sixteen participants were active or retired senior-level law enforcement officials. Of the active law enforcement officials, eight were chiefs of police, one was a deputy chief of police, one was a colonel, two were commanders, one was a major, and two were captains. One participant was a physician-consultant with research and training experience in law enforcement use of force and defensive tactics.

Participants with law enforcement experience represented agencies across the country. Fourteen participants were active law enforcement officers from local police departments; of these, eight represented police departments in urban settings, two represented police departments in suburban settings, and three represented police departments in small-town settings. One participant was an active law enforcement officer from a state law enforcement agency and one participant was a retired law enforcement officer from a local police department.

In summary, focus group participants were primarily active law enforcement chiefs from local police departments large and medium-sized cities.

Design and implementation. Each focus group session comprised between three and eight participants and lasted approximately 90 minutes. Because participants self-selected to join the focus groups, we could not be assured of an unbiased sample. However, as described in the participants section, the participants represented a variety of types of agencies and ranks of officers. Participants were offered time slots in which they could participate and selected based on availability. At the beginning of the session, the facilitator welcomed participants, briefly explained the purpose of the focus group, and established a few ground rules before verbally reminding the participants that their participation in the session was voluntary.

Method

The facilitator led participants through a set of predetermined, open-ended questions covering the range of topics listed in table 2. All questions encouraged participants to engage in open dialogue about ambush prevention, protection, and response policy, training, and operational practices.

Table 2. Focus group topics

Definitions
What constitutes an ambush?
Threat
How does the threat of ambushes compare to other threats that law enforcement face?
Preparedness
Training. How does law enforcement train to prevent, protect against, and respond to ambushes?
Equipment. What types of equipment and technology do law enforcement use to prevent and/or mitigate the effects of an ambush?
Policy. What are the policy implications for ambush prevention training practices?
Post-incident procedures
What do law enforcement agencies do after an ambush incident?

Throughout the sessions, the facilitator remained a neutral but active listener, paraphrasing comments and posing followup questions as appropriate to ensure that the note taker properly captured all comments. To ensure the anonymity of each comment, the note taker assigned a random letter to each participant prior to the start of the session and then used this letter in the notes to associate comments with the particular participant.

Analysis. After the conference, we reviewed notes from each session to identify common themes and key insights, focusing on officer safety policy and training implications. These themes highlighted new and emerging issues and trends that law enforcement may consider when developing ambush prevention, protection, and response training programs and policies.

Results and discussion

The difficulty of defining "ambush"

Participants had difficulty agreeing upon a single definition of "ambush," indicating that there is no universally accepted definition across U.S. law enforcement agencies. As a result, agencies define and report on ambushes differently. In general, participants described two types of incidents that law enforcement may classify as an ambush: In one scenario, the suspect plots to murder an officer in a surprise attack; in a second scenario, the suspect spontaneously attacks an officer. As discussed earlier, the former scenario is what the LEOKA data collection program refers to as an "entrapment and premeditated" ambush and is sometimes considered a "classic" ambush. The latter scenario is classified by the FBI as a "spontaneous" or "unprovoked" ambush, but some participants argued that these incidents should be considered crimes of oppor-

tunity or sudden assaults rather than ambushes, noting that they may be committed to evade capture or as a result of a "triggering event," in which case the suspect decides to attack the officer as a result of a specific event or development during his or her encounter with the officer. Despite differing views on what constitutes an ambush, participants agreed that every ambush involves some degree of planning and the element of surprise.

The lack of a clear definition has significant consequences. For example, without clear guidelines for what constitutes an ambush, law enforcement agencies may have difficulty articulating the nature of the threat, making it hard for agencies to train officers to recognize and respond appropriately to ambush situations. In addition, the absence of a clear definition leads to inconsistent reporting; in the long term, this makes it difficult to study ambushes and develop training and operational practices based on lessons learned from past ambush responses.

Tactical training

Participants described tactical or reality-based training as the best training tools to prepare officers for ambushes. Participants also highlighted the value of using nonlethal training ammunition ("Simunitions") when conducting hands-on training.

According to participants, current training across U.S. law enforcement agencies does not typically focus on ambushes but on general officer safety skills that apply to ambush situations, such as remaining vigilant. Even so, a few law enforcement agencies do conduct ambush-specific training. Although participants did not express a clear preference for either ambush-specific training or tactical training with implications for ambush scenarios, they agreed that agencies should dedicate more training hours to the subject. The biggest barriers to providing adequate training are resources and lack of in-house expertise, as many agencies do not have extensive—or in some cases, any—experience with ambushes.

Participants also considered the merits of military-style training. Participants had divergent opinions on the appropriateness of this approach, which emphasizes discipline and physical and mental toughness, to training both new recruits and current officers. Although participants affirmed a military-law enforcement nexus with respect to ambushes and critical incident response, they did not universally endorse the use of military-style training. Some participants expressed concern that military-style training does not align with law enforcement professionals' mission to serve as peace officers who form good relationships with the citizens of the communities they serve, even though they must also be willing to take aggressive action to enforce the law. The mission of law enforcement professionals differs considerably from the mission of soldiers, who are called to quickly identify and eliminate the enemy.

The divergent perspectives of focus group participants on the appropriateness of military-style training for law enforcement officers reflects the ongoing conversation playing out at the national level. Recently, the debate has been covered in popular media, often with a cautionary tone and reminder that the militarization of America's police forces is antithetical to the primary mission of law enforcement—to protect and serve the communities in which they reside—because it creates an "us versus them" mentality that may undermine an agency's ability to establish and maintain a cooperative partnership with the public. In our focus groups, advocates on both sides of the debate emphasize the importance of producing officers who are capable of quick and deliberate decision making. According to the proponents of military-style training, this is exactly what a more rigid, discipline-oriented training program produces. Those who favor a more community oriented or academic style of training point out that military-style training tends to produce officers who are adept at following orders but not necessarily well-equipped to think critically and nonlinearly.

First aid administration

One type of tactical training of particular value during violent encounters is first aid administration. According to physicians with expertise in this area, tactical medical training equips officers to treat themselves and their partners for extremity hemorrhage injuries. This class of injuries requires immediate treatment or the officer risks bleeding to death; as such, experts and our own focus group participants agreed that training officers in tactical emergency care could help officers survive ambushes and other critical incidents.

Participants stressed the importance of providing officers with the appropriate equipment and potentially life-saving supplies (e.g., tourniquets), as well as the appropriate training to understand when and how to use these supplies, to ensure the success of tactical medical training. Some law enforcement agencies have implemented programs to ensure that their officers are properly equipped and trained to administer emergency care to themselves or fellow officers, but it is not clear if this mentality is prevalent across U.S. law enforcement agencies. As is the case with training for general officer safety skills, experts insist that training for tactical medical administration should be conducted in an environment that simulates the stress and chaos that would typify a real-world situation in which officers incur life-threatening extremity hemorrhage injuries.

Learning from past critical incidents

Participants confirmed that the law enforcement community can learn a lot from reconstructing and analyzing past critical incidents, because these types of detailed analyses articulate exactly what happened and often present actionable lessons learned that agencies can incorporate into policies, training programs, and operational practices. Unfortunately, officers remarked that in-depth analyses of past critical incidents are hard to find, because most of the critical incident reporting that agencies come across in news bulletins present basic incident facts rather than an in-depth analysis of what happened.

On a related note, participants emphasized the importance of sharing critical incident information among law enforcement agencies and identified opportune times (e.g., roll call) to disseminate lessons learned to officers. According to one official, a significant hindrance to sharing information across the public safety community is that agencies do not always publish or widely disseminate the after-action reports that they produce after critical incidents.

Chapter 3. Environmental Factors in Ambush Prevalence

Introduction

Previous research on violence against the police has primarily focused on either homicides or assaults of the police. Only two research reports have specifically addressed ambushes of police. In 1974, the International Association of Chiefs of Police (IACP) released a manual for reducing the risk of ambushes, which included analysis of ambush circumstances to inform tactical response options (IACP 1974). Young (1990) examined the rates of ambush attacks on police as they related to the national murder rate and assaults against officers. However, neither of these analyses considered environmental factors related to ambush attacks, including departmental and community characteristics such as violent crime rates, departmental policies, and socioeconomic factors.

This chapter provides an analysis that fills that gap. First we describe the data and our method of analysis. Then we present our analytic findings, concluding with a summary of key takeaways. Specifically, we answer the following research question: **Does environment influence the likelihood and prevalence of ambushes?**

We observe the environment of police agencies by measuring community, organizational, and criminogenic characteristics of agencies and their jurisdictions. To do so, we constructed a dataset from four distinct sources described in the next section. We combined these data were combined for statistical associations between the number of ambushes occurring and organizational and community characteristics.

The current analysis builds upon previous research in three important ways. First, it examines organizational and community factors in the context of ambushes, a particular kind of violence perpetrated against the police. Second, it examines these factors using a large sample of agencies over a five-year period. Third, it uses an appropriate statistical technique to measure and analyze rare events such as ambushes.

Data

This section provides an abbreviated version of our data and methods and gives the reader a basic understanding of the information we used and how we used it to answer our research question.

The data for this analysis were compiled from four sources: (1) the Federal Bureau of Investigation's (FBI) Law Enforcement Officers Killed and Assaulted (LEOKA) database, (2) the FBI's Uniform Crime Reporting (UCR) program, (3) the Bureau of Justice Statistics' (BJS) Law Enforcement Management and Administrative Statistics (LEMAS) survey, and (4) the U.S. Census

Bureau's American Community Survey (ACS). The time period covered by these data sources data spans from 2007 to 2011 for the purposes of the current analysis. The data and their characteristics are described in this section.

LEOKA. The FBI has collected data on police killed in the line of duty since 1937. The data collection efforts eventually evolved into what is known today as the LEOKA program. On an annual basis and in conjunction with the UCR, the program collects agency- and incident-level data on assaults against the police. Five years (2007–2011) of LEOKA data were used to conduct this analysis.[3] Only agencies that self-reported LEOKA statistics for all 12 months for each of the five years were included in this analysis.

LEMAS. The BJS administers the LEMAS survey every three to four years to a sample of more than 3,000 police agencies including all agencies with 100 or more sworn officers. The data entail organizational characteristics such as agency responsibilities, expenditures, demographics, training, and community policing activities. The latest available data from LEMAS are from the 2007 survey. State, university, and special police agencies were excluded from the analysis for two primary reasons: First, they do not typically perform the same duties or provide the same services as city- and county-level agencies; and second, they serve jurisdictions that either (a) are not easily defined geographically or (b) span extremely large areas, making the use of Census data improper.

UCR. The FBI has collected crime data as part of its UCR program (originally conceived by the IACP) since 1930. The program collects crime statistics from more than 18,000 police agencies across the country. We obtained violent crime data from the 2007 UCR. Seven agencies were eliminated from the sample because of missing UCR data. Six agencies in the UCR dataset were missing population numbers, which we substituted with data from the ACS.

ACS. Every five years, the U.S. Census Bureau compiles population estimates as part of the ACS. The data encompass a host of community characteristics including demographics and social and economic indicators. Data from the 2009 survey were included in this analysis.

All of these datasets were combined to provide the researchers with a single dataset that is a large national sample of police agencies and provides information on their community, criminogenic, and organizational characteristics. This combination resulted in a sample of 846 police agencies. Table 3 on page 20 summarizes these data sources and the information they provided for the analysis.

3. The release and publication of LEOKA data generally lags by one to two years. At the time of this research, 2011 was the latest year for which data were available.

Table 3. Data sources

Data source	Year(s)	Description
LEOKA	2007–2011	Assaults against police
UCR	2007	Crime
LEMAS	2007	Police agency organizational characteristics
ACS	2009	Community characteristics

Sample characteristics

The final dataset includes 846 police agencies representing localities in 48 states.[4] It includes both municipal police agencies (72 percent) and sheriffs' offices (28 percent), which, compared to national estimates, slightly underrepresents municipal agencies (80 percent) and overrepresents sheriffs' offices (20 percent).

Table 4 describes our sample agencies in terms of population served compared with the 2007 national estimates developed by BJS, and table 5 provides the same information based on agency size determined by number of sworn officers (see Reaves 2010). These tables show that our sample comprises agencies that tend to be larger in size and serve larger populations than the national average.

Table 4. Agency size by population

Population served	Percent in sample	Percent nationally
< 10,000	27.1	73.3
10,000 to 99,999	50.1	24.5
≥ 100,000	22.8	2.3

Note: Rounding may cause totals not to sum to 100%.

Table 5. Agency size by sworn officers

Number of sworn officers	Percent in sample	Percent nationally
< 50	46.7	88.3
50 to 99	12.3	6.7
100 to 249	21.6	3.4
250 to 999	14.3	1.2
≥ 1,000	5.1	0.4

Note: Rounding may cause totals not to sum to 100%.

4. No localities from West Virginia or Wyoming are included in the final sample. Every agency in those two states failed to self-report LEOKA statistics for at least one month during the 2007–2011 time period.

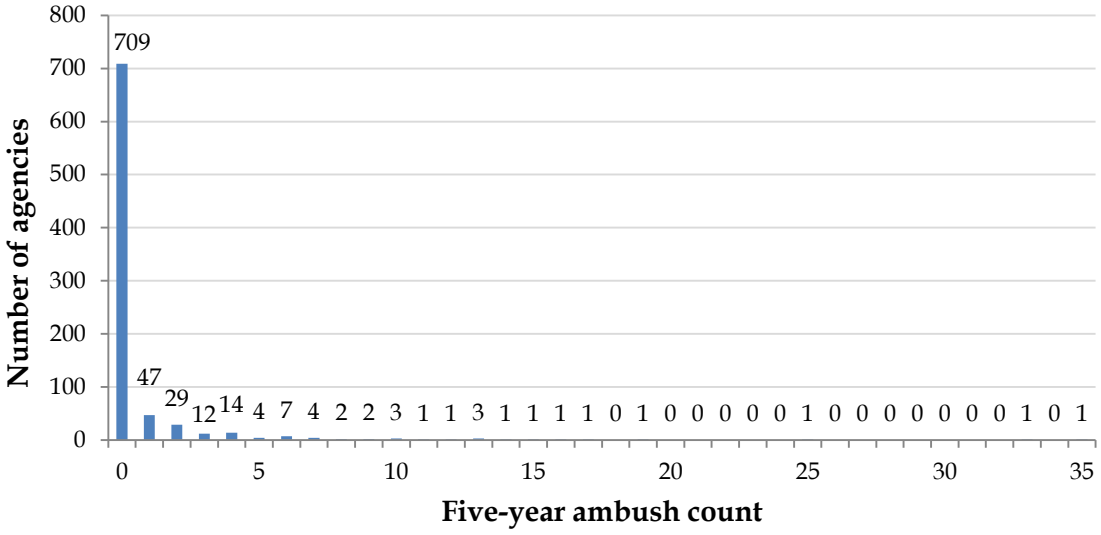
Method

The goal of this analysis is to understand whether the community, criminogenic, and organizational environments of police agencies influence the prevalence of ambushes against their officers. To examine this, we organize our data into a single outcome measure (i.e., police ambushes) and a collection of explanatory measures (i.e., the various environments in which the agency operates). We then employ a statistical technique that quantifies the impact of the agency's environment on the number of ambushes. In this section, we describe our measures and the analytic method we use to test their relationships.

Outcome measure

Because ambushes are such rare events, we use the five-year totals for each agency to yield a reasonably sized sample. Figure 2 shows that even when counting five-year totals, ambushes are rare events. Eighty-three percent (N=709) of our sample agencies had not experienced a single ambush in our five-year time frame. Another 5 percent (N=47) experienced one incident. Seven percent (N=59) experienced between two and five incidents. Just 2 percent (N=18) of agencies experienced between five and 10 ambushes. The remaining 3 percent (N=13) had 10 or more ambushes, the most of which was 35 experienced by one agency.

Figure 2. Ambushes of law enforcement officers, 2007–2011



Source: Data from LEOKA

Explanatory measures

We use past studies on violence against the police, described in the literature review, to identify key variables of interest. Table 6 displays the complete collection of variables and which data source they come from. We explore these factors in detail in the findings and discussion section.

Table 6. Explanatory variables

Variables	Data source
***Organizational* characteristics**	
Community policing index	LEMAS
Officer education requirements	LEMAS
New hires evaluated on conflict management skills	LEMAS
Hours of required annual in-service training	LEMAS
Female officers	LEMAS
Patrol officer in-car access to data	LEMAS
In-car camera use	LEMAS
Civilian review board for use of force	LEMAS
Racial similarity between department and community	LEMAS & ACS
***Community* characteristics**	
Positive socioeconomic status indicators	ACS
Negative socioeconomic status indicators	ACS
Violent crime rate	UCR
Assaults against officers	LEOKA

Community policing index

In order to measure community policing in an agency, we designed an index based on agencies' self-reported activities. Based on previous research, we employed the most frequently used measures in addition to two of the newest measures available from the latest LEMAS survey (see Steve Wilson and Zhao 2008; Chappell, MacDonald, and Manz 2006; Rosenbaum et al. 2011; MacDonald 2002; Schaefer Morabito 2010; Jeremy M. Wilson 2004; Jeremy M. Wilson 2005; Smith and Holmes 2014). Table 7 shows the activities and the required responses for the community policing index. Each agency's index was coded as the percentage of items listed in table 7 to which they responded affirmatively.[5]

5. Because some agencies did not have new officers the year in which the survey was conducted, some responded "not applicable." In those instances, the agency was scored on the basis of its nine potential indicators.

Table 7. Community policing index

Community policing activity	Response
Agency actively encourages officers to engage in SARA-type problem-solving projects	Yes
Agency includes collaborative problem-solving project in the evaluation criteria for patrol officers	Yes
Agency partners with citizen groups and includes their feedback in the development of policing strategies	Yes
Agency maintained or created a formal, written community oriented policing plan	Yes
New officers received at least eight hours of community oriented policing training	Half or more
In-service sworn personnel received at least eight hours of community oriented policing training	Half or more
Agency gave patrol officers responsibility for specific geographic areas	Yes
Agency conducted citizen police academy within the previous year	Yes
Agency conducted or sponsored a survey of citizens on a crime or police related topic during the past year	Yes
Agency maintained a community policing unit with full-time personnel	Yes

Racial similarity index

We measure racial similarity as the closeness between the demographics of the police agency and the population it serves. We use the following categories of race to compare: White, Not Hispanic; Black, Not Hispanic; Native American or Alaskan Native, Not Hispanic; Asian, Not Hispanic; Hawaiian/Pacific Islander, Not Hispanic; Two or More Races, Not Hispanic; Hispanic; and Other. Borrowing from the field of biology, we use a measure called the Morisita-Horn Index, which enables the researchers to account for and compare multiple categories of race across two groups (i.e., police agency and community).

Analytic method

Since we are interested in understanding what factors influence the occurrence of a rare event—police ambushes—we employ an analysis specifically tailored to such a tasking. We use a regression method called *negative binomial* regression. Because the dependent measure of five-year counts of ambush attacks against police officers is a single-side truncated count variable, a Poisson regression model would typically be indicated. However, the five-year count dependent variable is overdispersed, meaning that the sample standard deviation (s_x=2.72) is greater than the sample mean ($\bar{x}$=0.69). Given the overdispersed nature of the dependent variable, a negative binomial regression is most appropriate.[6] This method measures the statistical associations between organizational, community, and criminogenic factors and the prevalence of ambushes in police agencies. We present our findings from this analysis in terms of percentage increase or decrease in ambushes police agencies experience given these various factors.

6. While the data is also zero-inflated, a zero-inflated negative binomial regression is not theoretically appropriate because there is no reason to suspect there are multiple underlying processes resulting in zero counts. See Cameron and Trivedi (2005; 2009) for more information.

Results

We constructed an analytic model that accounted for all of the factors described in this chapter and found several statistically significant environmental predictors of police ambushes. Table 8 provides a complete report on the regression output. We describe the findings and their broader implications in the sections that follow.

Table 8a. Environmental characteristics analysis

Variable	IRR	Standard error	Z	P>|z|	95% confidence interval	Sig.
Five-year assault count	1.0009	0.0003	2.96	0.003	1.0003–1.0016	✓
Violent crime rate	1.0012	0.0003	3.73	0.000	1.0005–1.0019	✓
Newly hired officers must have at least some college	0.4593	0.1295	-2.76	0.006	0.2642–0.7983	✓
New hires are evaluated on conflict management	0.5664	0.1611	-2.00	0.046	0.3244–0.9890	✓
Community oriented policing Index	1.0140	0.0043	3.26	0.001	1.0056–1.0225	✓
Hours of in-service training (annually)	0.9992	0.0030	-0.26	0.795	0.9934–1.005	—
Percent female officers	1.0354	0.0215	1.67	0.095	0.9940–1.0785	—
Average number of cameras per patrol car	0.3904	0.1652	-2.22	0.026	0.1703–0.8949	✓
Officers use computers/terminals in the field	1.6526	0.6263	1.33	0.185	0.7862–3.4745	—
Civilian review board for use of force exists	1.1307	0.2904	0.48	0.632	0.6835–1.8707	—
Racial similarity index	1.0252	0.0168	1.52	0.128	0.9928–1.0587	—
Percent community members with high school diploma or more	0.9530	0.0234	-1.96	0.050	0.9082–1.0000	✓
Poverty rate (individuals)	0.9762	0.0244	-0.96	0.336	0.9295–1.0253	—
Percent individuals older than 5 years who speak English less than "very well"	1.0244	0.0228	1.08	0.278	0.9807–1.0702	—
Population	1.000	0.000	2.99	0.003	1.000–1.000	✓
Constant	0.2480	0.6226	-0.56	0.579	0.0018–33.9865	—
α (dispersion parameter)*	3.9202	0.5425			2.9889–5.1417	N/A

* The value for the dispersion parameter, α, is significantly greater than zero, confirming the appropriateness of the negative binomial model.

Table 8b. Model fit overview of table 8a

Model fit parameter	Value
Observations	846
Log likelihood	-565.24
Likelihood ratio for X^2 (14)	233.57
Probability > X^2	0.0000
Pseudo-R^2	0.1712

Organizational factors

Nonfactors. Among police agency organizational factors, we found that the amount of in-service training, measured by hours per year, did not have a significant impact on the prevalence of ambushes. The LEMAS data set does not break down in-service training by topic area (other than community oriented policing), so it is not possible to more specifically measure time spent on ambushes or ambush-related subjects. If these data were available, certain topic areas or types of training (e.g., reality-based) might be stronger predictors. We also found that officer access to computers in the field, measured by the percentage of patrol vehicles with computers, was not a significant predictor of ambushes encountered by a police agency. The existence of a civilian review board for use of force also did not have any impact on the number of ambushes against the police. The percent of officers who are women did not have any significant impact on ambushes. Last, we find that even when an agency's racial and ethnic makeup more closely resembles the racial and ethnic makeup of its community, it does not experience a significantly lower rate of extreme violence against the police.

More police ambushes. Our community policing index was found to have an unexpected positive, albeit very small, correlation with the number of ambushes. For every 1 percent increase in the number of community policing activities an agency undertook, that agency experienced an approximate 1 percent increase in the number of ambushes. We interpret this confounding finding in the discussion section of this chapter.

Fewer police ambushes. We found three organizational factors that were associated with reduced numbers of ambushes against the police. The effect of requiring new officers to have at least some college education was a 54 percent decrease in ambush assaults. In addition, agencies that evaluated new hires on conflict management experienced, on average, 43 percent fewer ambushes than those that did not. Last, in-car cameras, measured by the ratio of cameras to patrol vehicles, were associated with fewer ambushes. Police agencies that had a camera in every patrol car experienced, on average, 61 percent fewer ambushes than those that did not.

Table 9 on page 26 summarizes the organizational findings. We report the effect of statistically significant characteristics. Characteristics that were not found to be statistically significant are denoted with a dash.

Table 9. Organizational factors influencing ambush prevalence

Organizational characteristic	Effect on ambushes
In-service training hours	—
Use of computers in the field	—
Civilian review board	—
Evaluation of new hires on conflict management	-43%
One percent increase in female officers	—
One percent increase in community policing index	+ 1%
One percent increase in racial similarity index	—
Some college education required for new hires	-53%
In-car cameras across agency	-61%

Community factors

Nonfactors. Among police agency community factors, we found generally that socioeconomic indicators, both positive and negative, were not significant predictors of police ambushes. The poverty rate was not found to be a significant factor. A 1 percent increase in individuals who spoke English less than very well was associated with an approximate 4 percent increase in police ambushes; this just approached statistical significance ($p = .07$) and did not meet our standard for this evaluation.

More police ambushes. Violent crime and assaults against the police were each significantly associated with more ambushes; however, the effect sizes were very low. A 1 percent increase in the violent crime rate was associated with less than a 1 percent (.1%) increase in police ambushes. Likewise, each assault against the police was associated with less than a 1 percent (.1%) increase in police ambushes.

Fewer police ambushes. The percent of individuals with at least a high school diploma was associated with around 5 percent fewer ambushes.

Table 10 summarizes the community findings. We report the effect of statistically significant characteristics. Characteristics which were not found to be statistically significant are denoted with a dash.

Table 10. Community factors influencing ambush prevalence

Community characteristic	Effect on ambushes
One percent increase in individuals with at least high-school degree	-5%
Poverty Rate	—
Percent population speaking English less than "very well"	—
One percent increase in violent crime rate	+.1%
Assaults against the police	+.1%

Discussion

Our analysis uncovered several informative trends, some of which are supported by prior research on violence against the police and others that are worthy of further exploration. These findings should be considered preliminary because they were based on a first-time exploratory analysis on the topic of ambushes. Future research should build upon these findings through more theoretically informed, focused studies on ambushes and other forms of violence against the police. Consideration should also be given to more mixed-methods approaches that incorporate case studies, interviews, and other qualitative methods to help uncover *why* certain conditions do and do not give rise to police ambushes. We summarize the broad implications of our findings here.

Progressive hiring requirements in police agencies may help reduce acts of extreme violence against officers. Requiring at least some college education for new hires was associated with a remarkably lower incidence (-53%) of ambushes. Similarly, evaluating new hires on conflict management skills is associated with 40 percent fewer ambushes, though this finding just approaches statistical significance. It is important to note that these characteristics are measured at the agency level, not the officer level. Rather than reflecting an officer's individual capability to avoid ambush, they reflect the department's adherence to progressive policies that may result in positive improvements in community relations and decrease the chances of retaliatory attacks on police.

Together, though, these findings echo previous research on police use of force and education, which has found that an officer's educational attainment is associated with fewer uses of force, more restraint in force encounters, and fewer citizen complaints (see, e.g., McElvain and Kposowa 2008; Kappeler et al. 1992; Paoline and Terrill 2007; Rydberg and Terrill 2010). It has also been argued that more highly educated officers are less likely to engage in misconduct and that education is a prerequisite to fair and humane policing (Delattre 2002). Our findings indicate that police departments that place a greater emphasis on education and conflict resolution may have officers who are more apt to resolve conflicts without using force and therefore officers in that agency, as a whole, may be less likely to be victims of retaliatory attacks or targeted acts of extreme violence such as ambushes. More progressive hiring requirements may make for a safer department and community as a whole.

In-car cameras may promote officer safety. We found that agencies with in-car cameras in all of their patrol vehicles had 65 percent fewer ambushes than other agencies. Few studies have examined the impact of cameras on officer safety. The IACP (2004) studied the topic extensively. In a survey of more than 3,000 line officers, they found that one-third of officers generally felt safer because of in-car cameras. Nearly half of the officers in their study believed that citizens de-escalated on their own when they learned of the in-car camera. Officers also reported watching in-car camera video to self-critique their approach and tactics. Furthermore, the IACP study

notes the potential for in-car cameras to deter officer misconduct. With the recent proliferation of body-worn cameras, future research should examine the impact this technology has not only on citizen complaints and uses of force but also on violence against the police and officer safety.

Racial and ethnic representativeness in police agencies is not a panacea for improved police-community relations. Future research should consider using time-series analysis that tracks agency racial representativeness, community trust, police legitimacy, and assaults over time to better illuminate such a relationship and an increasingly important issue in an increasingly multicultural society. The racial similarity index we constructed was found to be associated with increased counts of ambush attacks. Although the effect size is small, this finding runs counter to calls for more diverse and representative police agencies to help mend weakened police-community relations (see, e.g., President's Task Force on 21st Century Policing 2015). If ambush assaults against the police are an indicator of significant strife and distrust between a police agency and its community, then our research finds that racial and ethnic representativeness does not impact such a relationship. Barrick et al. (2014) make similar findings with respect to assaults against the police and minority representation ratios in police agencies. However, as noted by Barrick et al. (2014), the correlation between assaults against police and representativeness may be due to agencies with troubled histories aggressively recruiting minority officers in an effort to improve community relations.

Common measures of community oriented policing are not associated with fewer ambushes. We found that community policing, as measured using LEMAS data, had the opposite effect than what we had expected. In our opinion, it is not within the realm of any plausible theory that community oriented policing is a contributing factor to violence against the police. Rather, we interpret this finding with three potential explanations. First and foremost, our model specification may not be capturing other relevant data that correlate with both community oriented policing activities *and* ambushes against the police. Second, there is the potential for reverse causality. In other words, agencies that have encountered significant strife and even violence in their community have responded with a multitude of community policing activities in an effort to bring about relative peace and tranquility in police-community relations. Third and last, we contend that measuring community oriented policing requires more than organization-level strategies and responses. While many organizational strategies have evolved to better enable community policing, it remains true that what the street cop is doing at the street level is at the core of community policing; this is something that is not captured by current national surveys and data collection systems.

Violence begets violence. It is unsurprising that violent crime and assaults against officers are positively associated with ambush attacks. This association supports previous research showing that violent crime is associated with violence against the police (Fridell et al. 2009; Jacobs and Carmichael 2002; Kaminski, Jefferis, and Gu 2003; Fridell and Pate 1995). There is also a growing body of evidence that violence by the police (e.g., officer-involved shootings) is correlated with violent crimes committed by non-police suspects (Fachner and Carter 2015; Stewart et al. 2012). Future research should further explore the geospatial relationship amongst violence against the police, violence by the police, and community violence, because violence reductions strategies can benefit from understanding the complex nature and nexus of community violence and state-citizen violence.

Chapter 4. Dynamic Incident Factors and Ambush Survivability

Introduction

To date, there has been no research or analysis on the survivability of ambush assaults. That an ambush is executed by surprise, from a position of concealment, and with overwhelming force makes it a particularly challenging incident, and it is important for the police community to understand how best to prepare officers to engage and survive such a life-threatening event. This chapter presents an analysis that fills this vital gap in knowledge. First, we describe the data we use and our analytic method. We then describe the findings from our analysis and a summary of key takeaways. Specifically, we answer the following research question: **What factors impact the survivability of an ambush assault?**

Data

To examine the factors that influence the survivability of an ambush assault, we use an incident-level dataset of all injurious and fatal assaults against the police. The data were collected as part of the LEOKA program and obtained from the FBI by the IACP.

Each year, the LEOKA program collects a sample of incident-level data on assaults against the police. These data are particular to incidents that resulted in injury from a firearm or sharp object. Specifically, the data collection form states:

> Please use this form to report circumstances and other details regarding law enforcement officers from your department who were killed or assaulted and injured with a firearm or a knife or other cutting instrument.

The form solicits information on the circumstances of the incident including the involved officer(s), suspect(s), location, and outcomes. We use the most recently available 10 years of incident-level LEOKA data at the time of this analysis, which includes all incidents from 2002 to 2011. Up until 2002, LEOKA had collected comparable incident-level data for fatal assaults only. Therefore, only from 2002 forward can we assess the survivability of an incident. We include all incidents that involved U.S. police agencies.

In response to the LEOKA survey, agencies are asked to classify the nature of the incident. Among the classifications are the following variables:

- Ambush (entrapment/premeditation)
- Unprovoked attack

Using the LEOKA classification system, we identified 178 ambush incidents involving 231 officers and 232 assailants from 2002 to 2011. In that same time period, police agencies reported a total of 2,208 officers ambushed,[7] which means our sample represents about 10 percent of all ambushes reported to the FBI in that same time period. Perhaps the most notable distinction in the incident-level data is that these are the most serious incidents reported, all of which resulted in injury to an officer. Among the larger figure of 2,208 ambushes are noninjurious incidents, including those that did not involve any material weapons.

Sample characteristics

Our sample of ambush incidents come from a diverse collection of police agencies. We present their characteristics here to inform the reader of the types of agencies in which the incidents occurred. Many of these characteristics may simply tell us about where injurious and fatal ambushes are occurring. Therefore, comparisons to national figures are for informational purposes and are not intended to assess the representativeness of the sample.[8]

Among our cases, 35 percent of officers were members of county law enforcement, 56 percent were municipal law enforcement, about 9 percent were state law enforcement, and 1 percent of the officers were federal law enforcement agents. The jurisdictions where officers were ambushed were generally larger than police jurisdictions nationally. For example, while the majority (73%) of police agencies nationwide serve populations less than 10,000, 10 percent of our sample were from these smaller jurisdictions. Consequently, agencies that serve populations of 10,000 or more are overrepresented in our sample, as are state agencies. However, this may simply tell us that injurious and fatal ambushes are not occurring in a nationally representative pattern of jurisdictions. Table 11 on page 32 summarizes the relative sizes of agencies in our sample and nationwide.

[7] This refers to the aggregate LEOKA data, which was analyzed in the previous chapter. These data do not include incident details.

[8] To assess sample bias, we would need some understanding of the entire population of injurious and fatal assaults and ambush incidents.

Table 11. Sample characteristics compared with national distribution

Population served	Percent in sample	Percent nationally
< 10,000	10.5	73.3
10,000 to 99,999	42.0	24.5
≥ 100,000	37.6	2.3
State agency	8.8	N/A
Federal agency	1.1	N/A*

* The source for national data (2007 LEMAS data) does not include information about or data from federal agencies.

There is representation from all parts of the United States in our sample. The region with the largest representation was the South, with nearly half of the officers coming from southern agencies.[9] The West and the Midwest each accounted for around 20 percent of the officers. The Northeast had the smallest representation of officers, constituting 10 percent of our total sample. Our sample includes officers from 37 of the 50 states, in addition to the District of Columbia. Each state had a range of 1 to 25 officers, with an average of 6.2 per state.[10]

Method

The goal of this analysis is to understand whether any incident factors are associated with the survivability of an ambush assault. First, we provide a descriptive analysis of the incidents, the involved persons, and the dynamic incident characteristics. We organize our data into a single outcome measure (i.e., survival) and a collection of explanatory variables (i.e., officer, suspect, and incident characteristics). We then compare officer survival rates based on these explanatory factors. Last, we employ a statistical technique that quantifies the relative impact of various officer, suspect, and incident characteristics on the likelihood that the officer survives the attack.

Outcome measure

Our outcome measure is a straightforward dichotomous variable that answers an essential question for this analysis: "Did the officer survive the ambush?" Of the 231 officer ambushes in our study, we found a remarkably even distribution of survivals and fatal outcomes. Table 12 shows that 47.6 percent of officers survived, and 52.3 percent were killed.

Table 12. Ambush outcomes: survivability

Ambush outcome	N	Percent
Survived	110	47.6
Fatal	121	52.3

[9] For this analysis, we used the four Census-defined regions of the United States—South, Midwest, West, and Northeast. "Census Regions and Divisions of the United States," U.S. Census Bureau, accessed October 7, 2015, http://www2.census.gov/geo/pdfs/maps-data/maps/reference/us_regdiv.pdf.
[10] The median was five officers per state.

Explanatory measures

Our explanatory measures comprise a collection of officer, incident, and suspect characteristics. Our selection of measures is based on the previous research described in our literature review and what is available through the LEOKA data collection program. We develop our model based on the results of our comparison of survival rates based on officer, suspect, and incident characteristics. We describe these measures in the findings section.

Analytic method

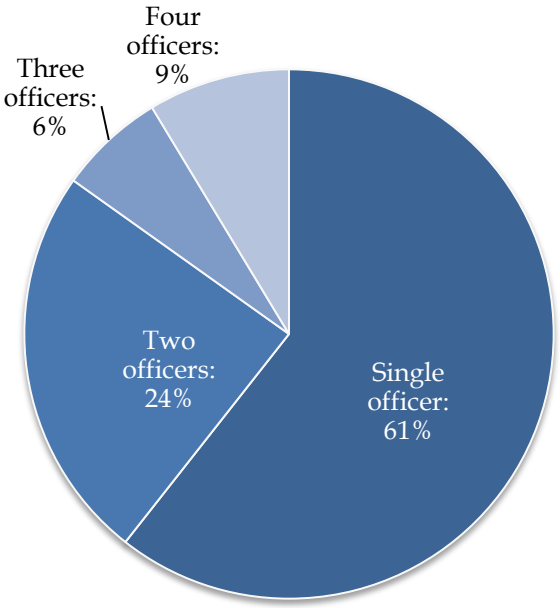
We use a multivariate logistic regression analysis to measure the association between our explanatory measures described earlier and the survivability of an ambush assault. This method is ideally suited for dichotomous outcomes such as ours (survived versus fatal) and can help illuminate predictors of survival. We present our findings from this analysis in terms of percentage change in the odds of survival given each of these predictors.

Results

Officer characteristics

There were 231 officers ambushed in 178 separate incidents, which yields an average of about 1.3 officers per incident. Figure 3 on page 34 shows the complete distribution, ranging from 1 to 4. More than half of the incidents involved just one injured or killed officer. An additional quarter of incidents involved two officers. These numbers reflect the number of officers injured or killed during the incident. If an officer was on the scene of the incident and not injured or killed, their information, even their presence is not captured in the LEOKA data instrument.

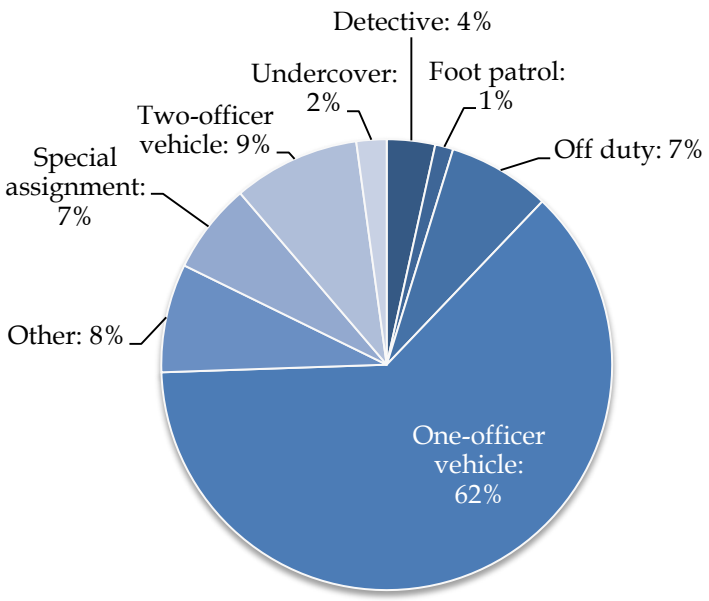
Figure 3. Ambush incidents involving different numbers of officers (N=231)



Source: Dataset compiled from LEOKA incident sample

Officers were on various assignments at the time of the attack. Among the 231 officers, most (62%) were working in a single-officer patrol vehicle. The second-most frequent assignment was a two-officer patrol vehicle, which accounted for just 9 percent of incidents. Figure 4 on page 35 shows the complete breakdown of officer assignments. This descriptive trend cannot be interpreted as meaning officers in single-officer vehicles are *more likely* to be ambushed. It likely reflects the fact that, because most officers patrol in single-officer vehicles, a higher percentage of officers will be attacked in single-officer vehicles. However, to truly gauge this issue, there would need to be a national benchmark of the percentage of officers in single-officer vehicles versus two-officer vehicles. Such data is not available.

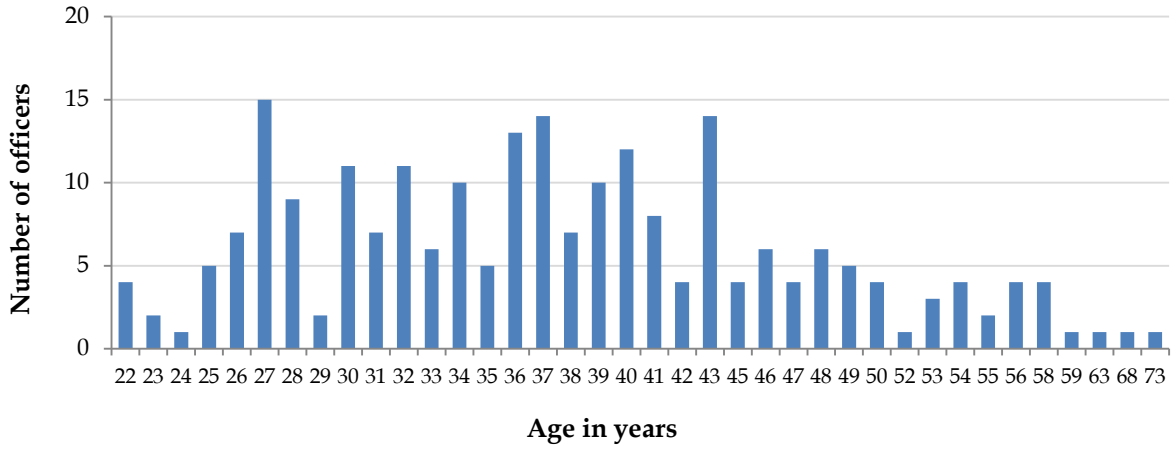
Figure 4. Officer assignment when ambushed (N=231)



Source: Dataset compiled from LEOKA incident sample

The vast majority of officers were men (97%) and the most represented racial category was White (88%). The next highest represented racial group was Black officers (10%), followed by American Indians (2%) and Asians (~1%). The average age of officers who were ambushed was 38 years. Officers who survived and officers who were killed were nearly identical in average age. Officers who survived were 37.8 years old, on average, whereas officers who were killed in ambushes were an average age of 38 years old. Figure 5 on page 36 shows the complete distribution for the age of officers.

Figure 5. Age of ambushed officers



Source: Dataset compiled from LEOKA incident sample

Officers ranged widely in their years of experience, from less than a year to a little more than 44 years on the job. The average experience was about 11 years. Officers who survived averaged 11.4 years of experience, and those that were killed averaged 10.5 years of experience. Figure 6 shows the complete distribution of experience for officers in our sample.

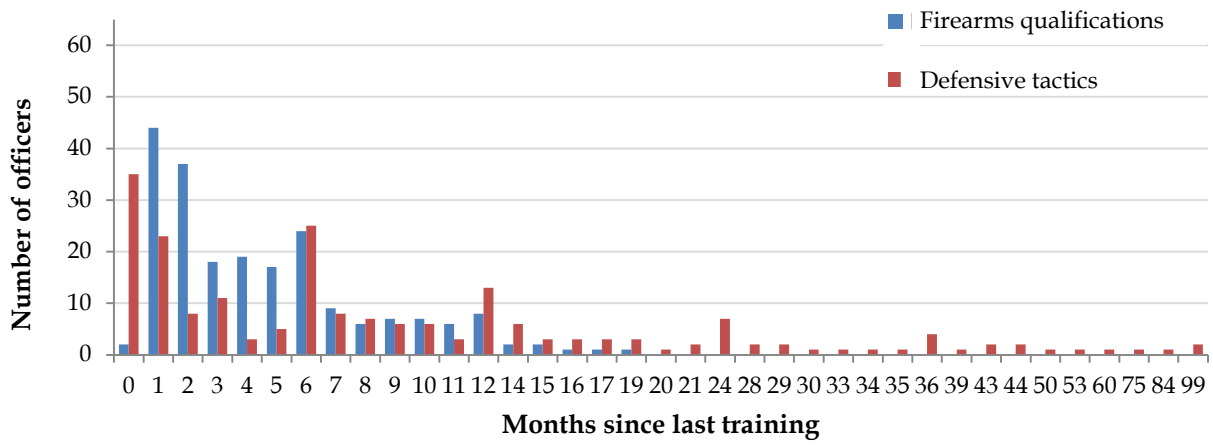
Figure 6. Experience of ambushed officers

Source: Dataset compiled from LEOKA incident sample

Some ambushed officers had completed firearms qualifications within weeks before the incident, and some had gone nearly three years without qualifying. On average, officers had qualified between 4 and 5 months prior to the incident. The modal amount of time since firearms qualification was one month. One in five officers completed firearms qualifications just one month before they were ambushed. 96 percent of officers had completed qualifications within a year of being ambushed. The average length of time since completing firearms qualifications was 4.9 months for officers who survived their ambush and 4.8 months for those that were killed.

The recentness of defensive tactics training has a far wider spread, ranging from less than a month prior to the incident to more than 8 years earlier. Although more than half (54%) of the officers had completed defensive tactics training within six months of the incident, a quarter (25%) had not completed any training within the past year. Twelve percent of officers had gone two years or more without defensive tactics training. On average officers had trained in defensive tactics 11 months before they were ambushed. Note, however, that this is a skewed average due to a relatively small number of very long periods without any training. The mode time since last defensive tactics training is six months. Officers who survived had trained in defensive tactics an average of 9.5 months before they were ambushed, compared to an average of 13 months for those who were killed. Figure 7 provides the complete distributions for the recentness of both firearms qualifications and defensive tactics training.

Figure 7. Recent training of ambushed officers



Source: Dataset compiled from LEOKA incident sample

We tested the statistical significance of the differences in the averages of each of the officer characteristics discussed in this section, grouping the data by fatal and nonfatal incidents. Table 13 on page 38 shows that the number of officers on the scene at the onset of the ambush, officer

age, experience, and recentness of their firearms and tactical training are, on average, about the same for officers who survived as for officers who were killed. The largest difference in means we see is in the recentness of defensive tactics training, where survived officers completed training, on average, three months closer to the incident than those who died. However, these differences were not statistically significant.

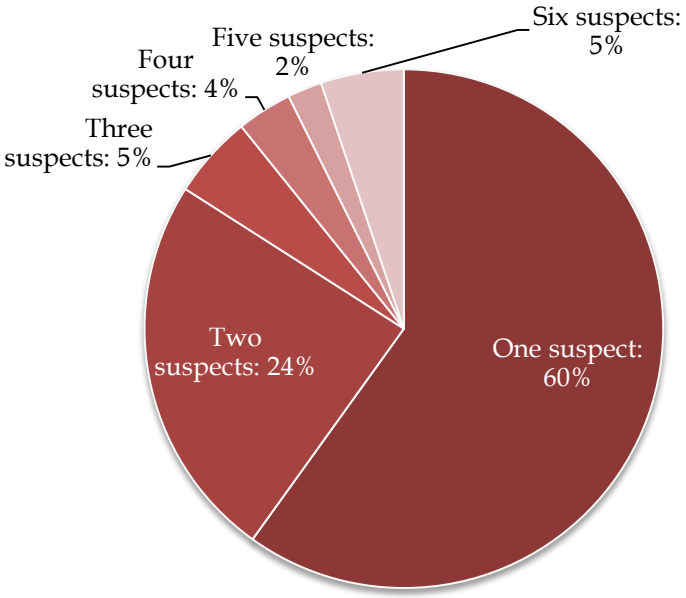
Table 13. Situational characteristics of fatal and nonfatal ambushes

Officer characteristics	Fatal			Nonfatal			95% Confidence interval (avg. diff.)	t	df	Pr	Sig.
	Avg.	Std. dev.	N	Avg.	Std. dev.	N					
Number of officers	1.7	1.01	121	1.5	0.86	110	-0.10–0.39	1.194	229	0.234	—
Age (yrs.)	38.0	8.69	121	37.8	10.18	107	-2.28–2.64	0.142	226	0.887	—
Experience (yrs.)	10.5	7.41	121	11.4	9.28	108	-3.13–1.23	-0.860	227	0.391	—
Last firearms qualification (mos.)	4.7	4.04	109	4.9	4.70	102	-1.37–1.01	-0.297	209	0.766	—
Last defensive tactics training (mos.)	13.0	19.19	105	9.5	11.61	100	-0.92–7.87	1.557	203	0.121	—

Suspect characteristics

A total of 232 assailants were involved in the 178 ambush incidents. They were by most accounts local residents. Among the suspects for whom residence data was available (N=213), the vast majority (85%) had residences within the same county in which they executed their attack. Nearly all (94%) resided in the same state in which they executed their attack. On average, there were 1.3 suspects per incident, ranging from 1 to 6. With the one exception that 7 percent of incidents involved more than four suspects, the breakdown of suspect numbers is largely similar to that of officers per incident (see figure 8 on page 39).

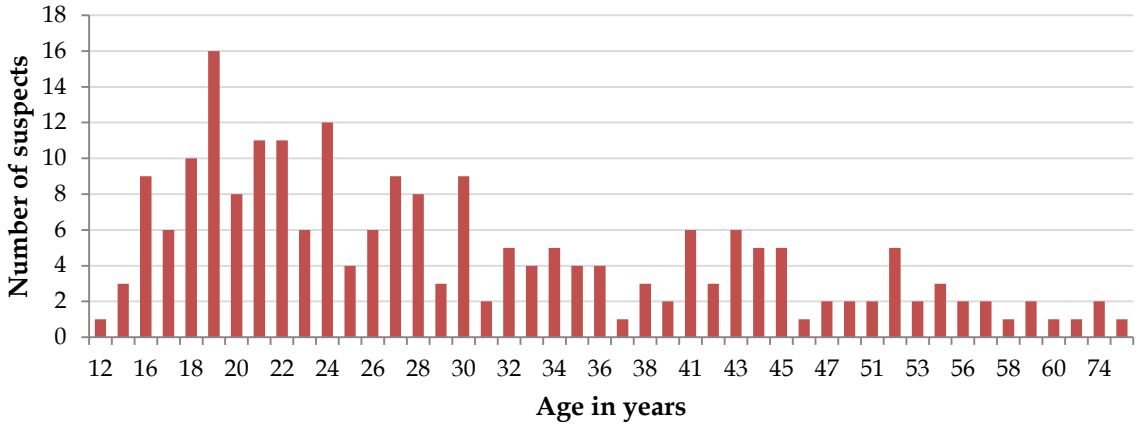
Figure 8. Ambush incidents involving different numbers of suspects (N=231)



Source: Dataset compiled from LEOKA incident sample

Nearly all (98%) of the suspects were men. A majority (60%) of suspects were White, and most (38%) of the remaining suspects were Black. About one and a half percent of the suspects were American Indian and less than one percent were Asian. On average, suspects were 30.8 years old, ranging in age from 12 to 80 years. The median age of suspects was slightly younger than the median age of officers at 27 years. However, figure 9 on page 40 shows a large cluster of suspects between ages 18 and 24 years, which accounts for 34 percent of all ambush assailants.

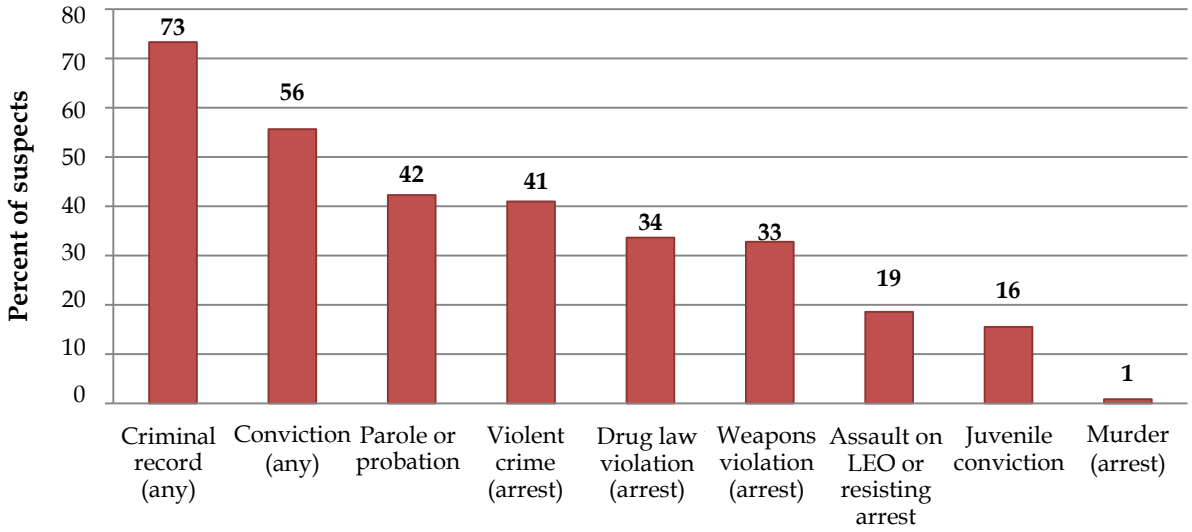
Figure 9. Age of ambush suspects



Source: Dataset compiled from LEOKA incident sample

As shown in figure 10 on page 41, nearly three-quarters of assailants had a criminal record, and more than half were convicted of a crime prior to the ambush incident. Sizable proportions of suspects had previously been on parole or probation (42%) or had been arrested for a violent crime (41%), drug law violations (34%), or weapons violations (33%). Close to one in five suspects had previously been arrested for assault on a law enforcement officer *or* resisting arrest—though the coupling of these two charges makes interpretation difficult. The difference in gravity in an assault versus resisting arrest can be extreme. Where resisting arrest may, in fact, be indicative of previous violence and aggressive hostility towards law enforcement, it is far more ambiguous. Fifteen percent of suspects had been convicted of a crime as a juvenile. And a very small number (N=2) of suspects had previously been arrested for murder.

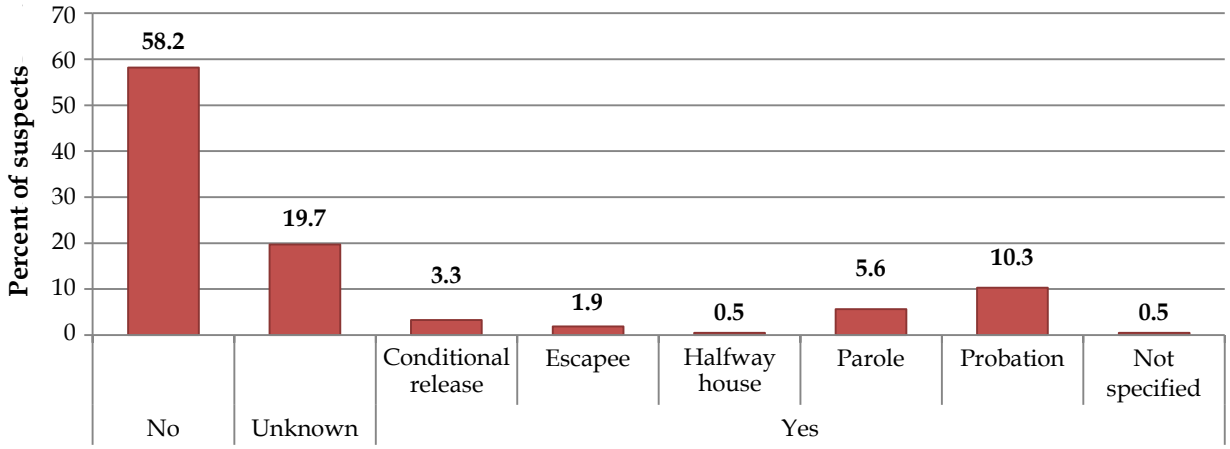
Figure 10. Prior interaction with criminal justice system



Source: Dataset compiled from LEOKA incident sample

Although most suspects had some previous interaction with the criminal justice system, most (58%) were known not to have been under judicial supervision at the time of the incident, whereas a combined 22 percent were under some form of judicial supervision. Most of those under supervision were on probation (10%) or parole (6%). Just 3 percent of assailants were out on conditional release. Close to 2 percent were escapees. And just one assailant (< 1%) was in a halfway house. Whether they were under judicial supervision was unknown for close to 20 percent of suspects. Figure 11 on page 42 shows this breakdown.

Figure 11. Under judicial supervision at time of ambush

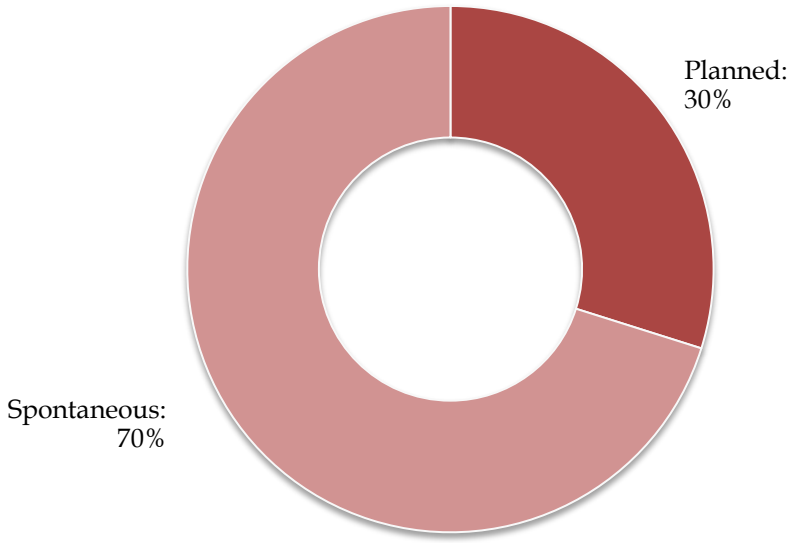


Source: Dataset compiled from LEOKA incident sample

Aside from what can be deduced from the assault itself, the suspect's state of mind, such as being under the influence of a controlled substance (e.g., alcohol or narcotics) or having a known mental illness is largely unknown, which makes it difficult to identify any trends in the mental state of these suspects. For example, while the LEOKA data indicate affirmatively that a total of 13 percent of suspects were under the influence of narcotics at the time of the incident, in the majority (65%) of cases this is unknown. A similar response pattern exists when considering whether the suspect was under the influence of alcohol at the time of the incident. With respect to mental illness, the majority of suspects (83%) were not known to have a mental illness prior to the attack. It should be noted that this statistic refers only to the department's knowledge prior to the attack. Data on whether the suspect was in fact mentally ill is not captured in the FBI's database.

The majority (70%) of officers were attacked spontaneously. In other words, the suspects had not planned the ambushes. They were spontaneous acts in which the assailants made the decision at the time of the officers' approach or at some point during their interaction when the officers would not expect an attack. As shown in figure 12 on page 43, thirty percent of ambushes were premeditated attacks, in which the officers were targeted by the assailants. In these incidents, the suspects likely initiated the interactions with the officers and may have used deception or luring tactics to ensure law enforcement response.

Figure 12. Precipitating event: premeditated versus spontaneous ambush (N=231)



Source: Data set compiled from LEOKA incident sample

We examined the characteristics of suspects and their differences between incidents in which officers survived and those in which officers were killed. Because many incidents involved multiple suspects and officers, all of whom have their own individual set of characteristics, we examine suspect characteristics per incident. For example, in incidents in which there was more than one suspect, we examine whether *any* of the suspects had the characteristics in question and whether those incidents involving suspects with those characteristics were associated with significantly different officer fatality rates.

We used a grouped means comparison test of statistical significance to examine the average number of suspects and the outcome for each officer. On average, officers who were killed faced about 1.5 suspects. Officers who survived faced about 1.3 suspects. As shown in table 14, this difference was not statistically significant. In other words, we cannot say with reasonable certainty that the number of suspects for fatal and nonfatal officer ambushes is not the same.

Table 14. Number of suspects in fatal versus nonfatal ambushes

Suspect characteristics	Fatal			Nonfatal			t	df	Pr	Sig.
	Avg.	Std. dev.	N	Avg.	Std. dev.	N				
Number of suspects	1.57	1.07	121	1.34	0.77	110	1.81	229	0.071	—

We also compared the survival rate of officers who were ambushed by suspects of various criminal histories using the chi-square statistic to determine statistical significance. Statistically significant differences are indicated with a check in the last column. We found officer survival rates to be significantly lower when three suspect characteristics were present. Officers who were ambushed by a suspect or group of suspects with a criminal record survived just 43 percent of the time, compared to 67 percent when the suspects did not have any criminal record. Similarly, officers who were ambushed by suspect(s) with prior conviction(s) survived at a significantly lower rate (47%) than those ambushed by suspects without prior convictions (61%). Last, if the suspect(s) were previously on parole or probation, the officer survival rate was significantly lower—42 percent compared to 56 percent when the suspect(s) were not previously on parole or probation. Other criminal history characteristics were not significantly correlated with officer survivability. Survival rates were also not significantly different for premeditated versus spontaneous attacks. Table 15 on page 45 shows the comparative officer survival rate for all suspect characteristics.

Table 15. Survivability analysis based on suspect characteristics

Suspect characteristics		Officers (N)	Survivors (N)	Officer survival rate (%)	X^2	df	Pr	Sig.
Criminal record	No	52	35	67.3	9.18	1	0.002	✓
	Yes	173	75	43.3				
Prior conviction	No	83	51	61.4	8.30	1	0.004	✓
	Yes	128	55	47.6				
Juvenile conviction	No	188	94	50.0	0.56	1	0.452	—
	Yes	37	16	43.2				
Prior parole/probation	No	115	65	56.2	5.48	1	0.019	✓
	Yes	110	45	40.9				
Prior violent crime	No	120	61	50.8	0.39	1	0.533	—
	Yes	105	49	46.7				
Prior murder	No	223	109	48.9	0.00	1	0.975	—
	Yes	2	1	50.0				
Prior drug law violation	No	147	78	53.1	2.95	1	0.086	—
	Yes	78	32	41.0				
Prior assault on police or resisting arrest	No	182	91	50.0	0.47	1	0.493	—
	Yes	43	19	44.2				
Prior weapons violation	No	139	73	52.5	1.92	1	0.166	—
	Yes	86	37	43.0				
Under judicial supervision	No	140	60	42.9	0.02	1	0.889	—
	Yes	50	22	44.0				
Premeditation	Planned	69	30	43.5	0.68	1	0.411	—
	Spontaneous	162	80	49.4				

Incident dynamics

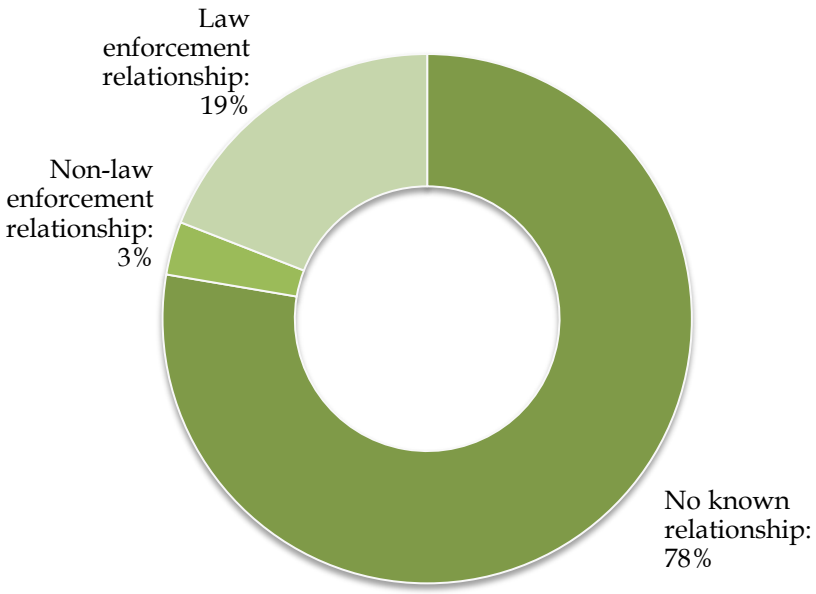
Incident dynamics are the facts and circumstances related to the interaction between the officer and the suspect other than the personal history and characteristics each brings with them to the event. Incident dynamics can be described as falling into three categories of data: first, they are characteristics of the environment in which the incident took place, such as being indoors versus outdoors, being at a residence versus a commercial establishment, or the lighting conditions; second, they are characteristics that would not exist if not for the incident itself, such as taking cover, the number of rounds fired, the distance between the officer and the suspect, or the assistance of another officer; third and last, they are characteristics that are not intrinsic to the officer or suspect, such as wearing a ballistic-resistant armored vest or the type of weapons used.

This section presents descriptive trends on these dynamics. Some incident dynamics are officer-specific (e.g., taking cover or rounds fired), and some are incident-specific (e.g., location or lighting conditions). Because the primary interest of this study is officer survival rates, we calcu-

late trends using the officer as the unit of analysis. Therefore, incident-specific characteristics for incidents in which more than one officer was involved are counted more than once. In sum, these trends represent the collective experiences of all ambushed officers rather than all ambush incidents.

In most cases (78%), the assailant and the officer had no known prior relationship. If they did, it was typically a relationship related to law enforcement. In total, 19 percent of the officers ambushed had a prior law enforcement relationship with at least one of the attackers. Figure 13 illustrates the range of possibilities.

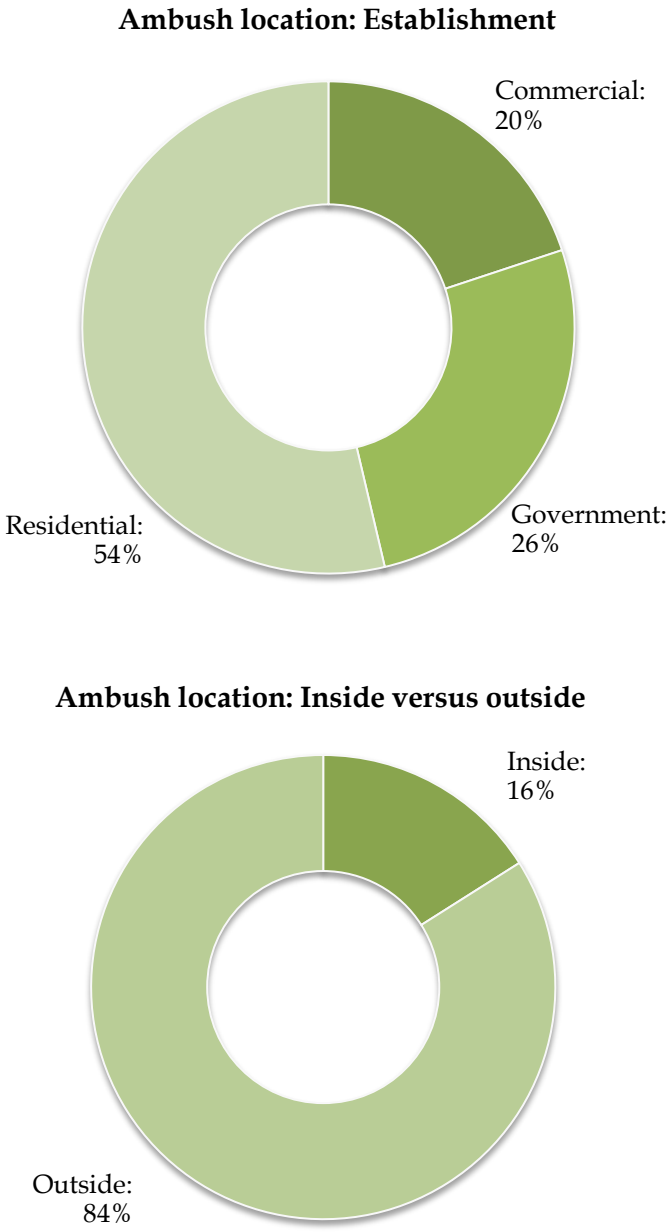
Figure 13. Assailant-officer relationship (N=231)



Source: Dataset compiled from LEOKA incident sample

Just more than half of the officers who were ambushed were at a residential location when the incident occurred. About a quarter of ambushes took place on government property; this includes inside or outside of courthouses, state or national parks, police stations, or other municipal-owned properties. One in five officers were at commercial locations, such as business districts or retail locations. A large majority (84%) of incidents took place outside. This total includes incidents in which officers were clearly outside (such as on a highway making a traffic stop) or were just outside of a building but on residential or commercial property, as well as incidents in which they were inside their patrol vehicle. Figure 14 on page 47 shows these breakdowns.

Figure 14. Ambush locations (N=231)

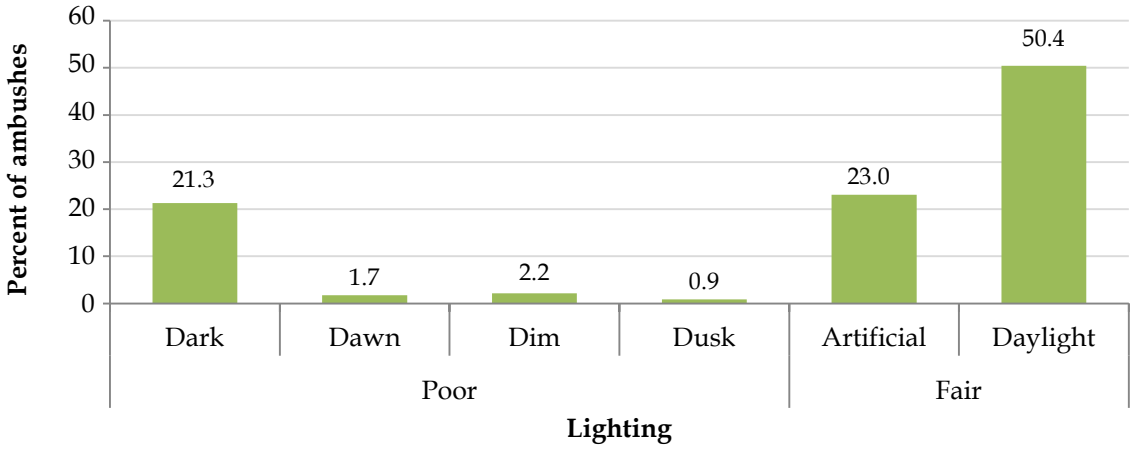


Source: Dataset compiled from LEOKA incident sample

LEOKA categorizes lighting conditions into six categories: dark, dawn, dim, dusk, artificial, and daylight. We collapsed those conditions into two: poor and fair, with dark, dawn, dim, and dusk being classified as poor and artificial and daylight being classified as fair. There was poor lighting in approximately 26 percent of officer ambushes, most of which were explicitly "dark"

conditions. The majority (73%) of incidents, however, occurred under relatively fair lighting conditions, whether artificial or daylight. Figure 15 illustrates the range of lighting conditions, showing the original LEOKA categories and our two collapsed categories.

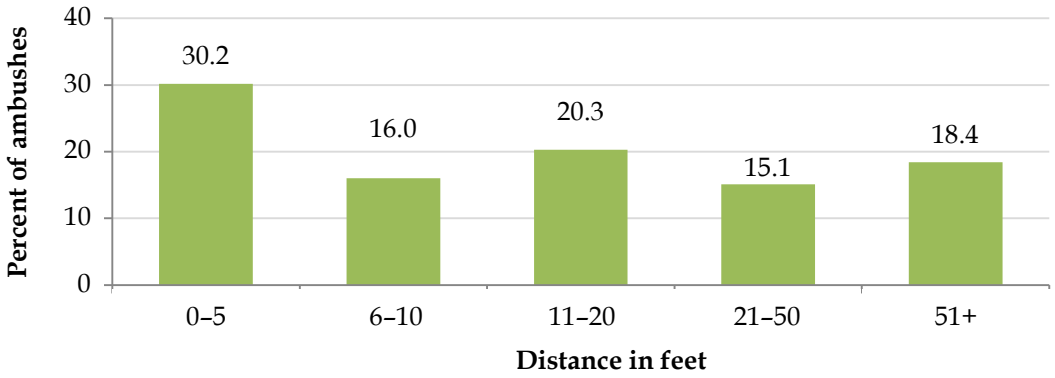
Figure 15. Lighting conditions in ambushes



Source: Dataset compiled from LEOKA incident sample

The distance between the officer and suspect at the onset of the attack ranged from less than one foot to more than 50 feet. A plurality (30%) of ambushes occurred when the officer and suspect were very close to each other-five feet or less. On the other end of the spectrum, 18 percent of officers were more than 50 feet away from the suspect. Figure 16 on page 49 shows the complete distribution, as reported to LEOKA.

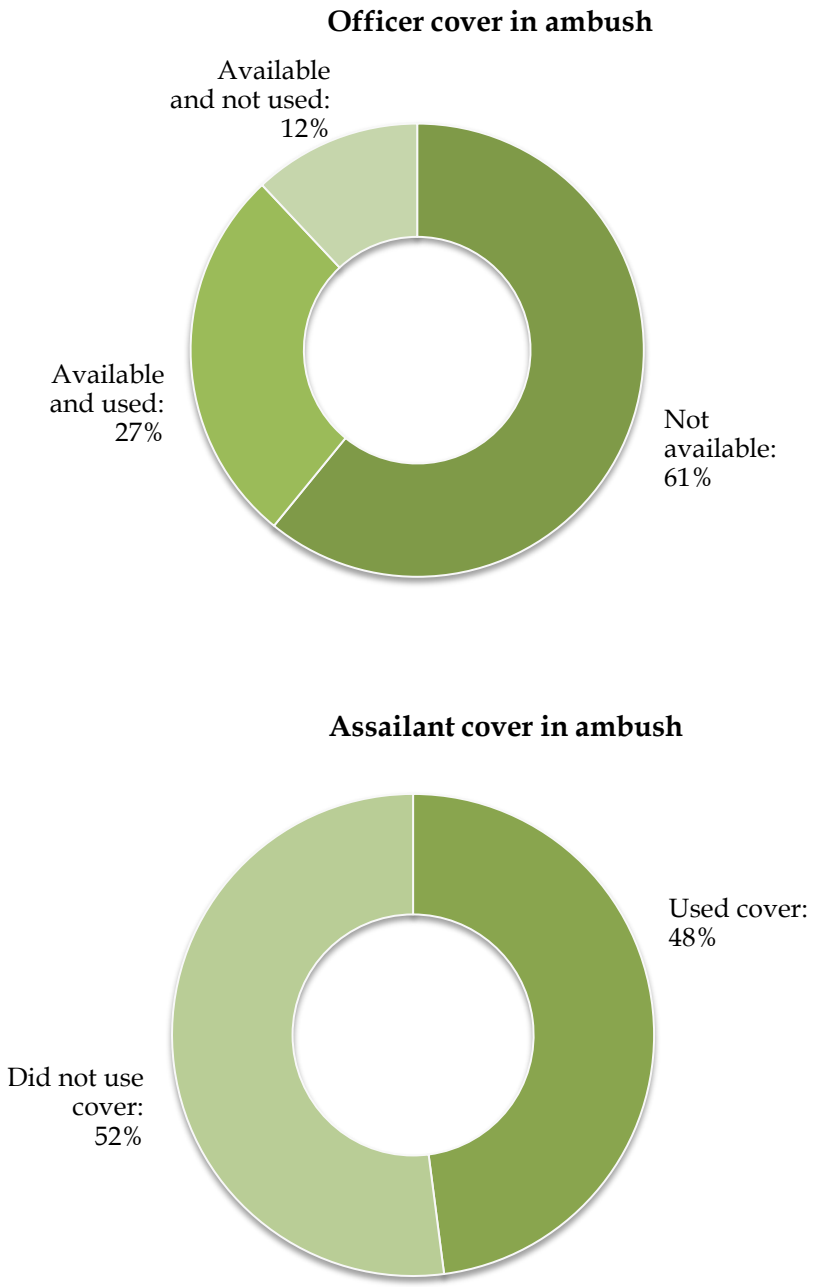
Figure 16. Distance between officer and assailant



Source: Dataset compiled from LEOKA incident sample

A little more than a quarter (27%) of officers took cover. For the most part, officers did not take cover because there was none available to them. Suspects, on the other hand, used cover nearly half (48%) of the time. This disparity highlights the tactical disadvantage of officers when facing an unknown or unrealized threat at the time of impact. Figure 17 on page 50 shows the complete breakdown of officer and suspect use of cover.

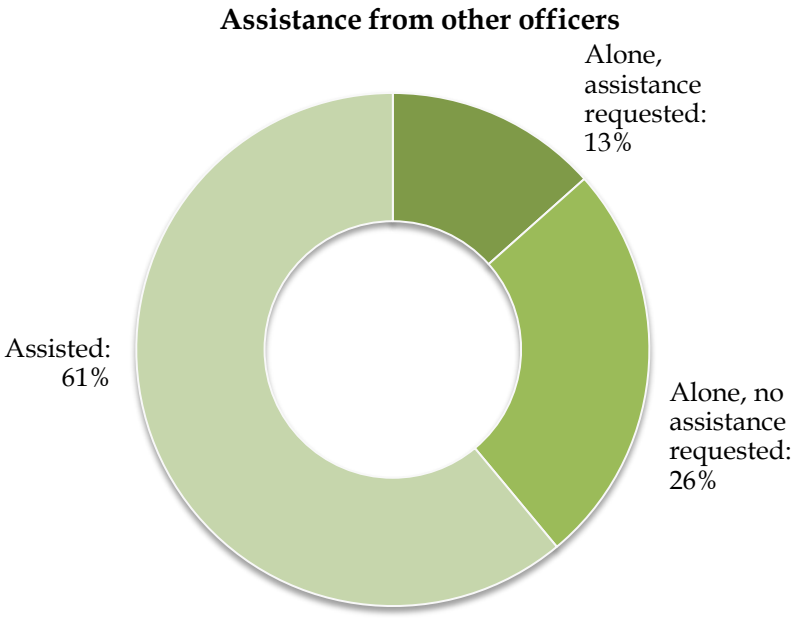
Figure 17. Officer and assailant cover in ambush (N=231)



Source: Dataset compiled from LEOKA incident sample.

Officers were ultimately assisted by other officers 61 percent of the time. About a quarter (26%) of officers were alone and never requested assistance; this could be due to the suddenness of the assault and the possibility that the officer was immediately incapacitated. An additional 13 percent of officers requested assistance but the incident began and ended prior to the arrival of backup. Figure 18 illustrates the involvement of other officers in response to the incident.

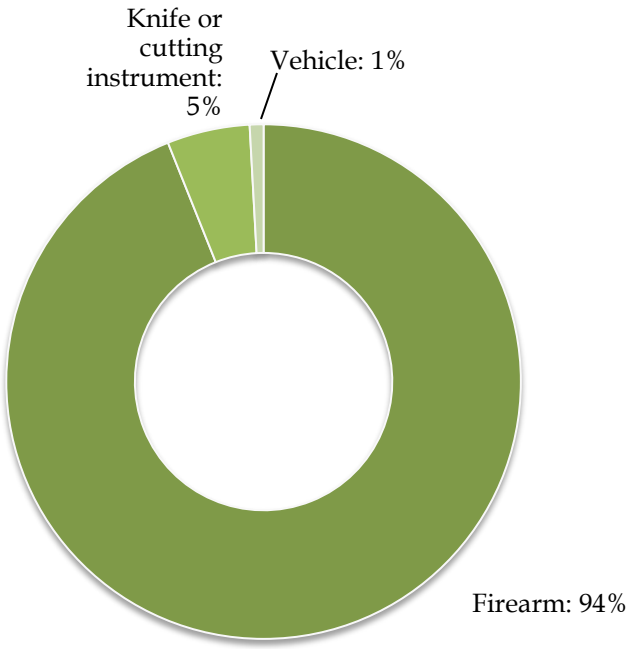
Figure 18. Assistance from other officers



Source: Dataset compiled from LEOKA incident sample.

The vast majority (94%) of ambushed officers faced an assailant armed with a firearm. A knife or other sharp object was the weapon of choice or convenience in 5 percent of ambushes. A vehicle was used as a weapon in 1 percent of ambushes. Among the firearms used, handguns were most popular and used in 45 percent of the incidents. The next most popular firearm used was a rifle, used in about 40 percent of incidents. Both were typically semiautomatic. Shotguns were used in just 12 percent of incidents and were usually pump-action. Figure 19 on page 52 illustrates the breakdown of weaponry among assailants.

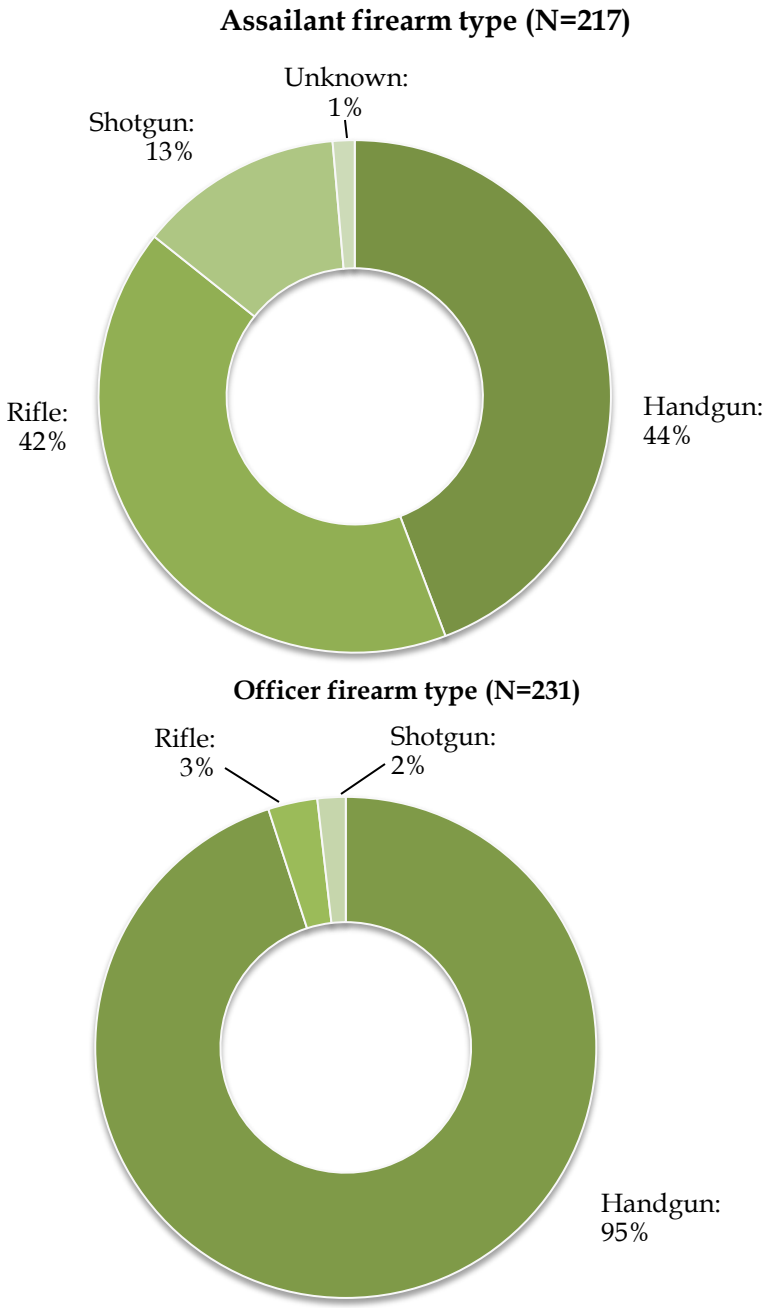
Figure 19. Assailant weapon (N=231)



Source: Dataset compiled from LEOKA incident sample.

Officers were often outgunned. Figure 20 on page 53 shows the diversity of firepower held by assailants who were armed with firearms. Assailants were armed with a handgun most frequently (44%), but they were nearly as frequently (42%) armed with a rifle. Officers, on the other hand, were armed with their handgun 95 percent of the time.

Figure 20. Assailant and officer firearm type

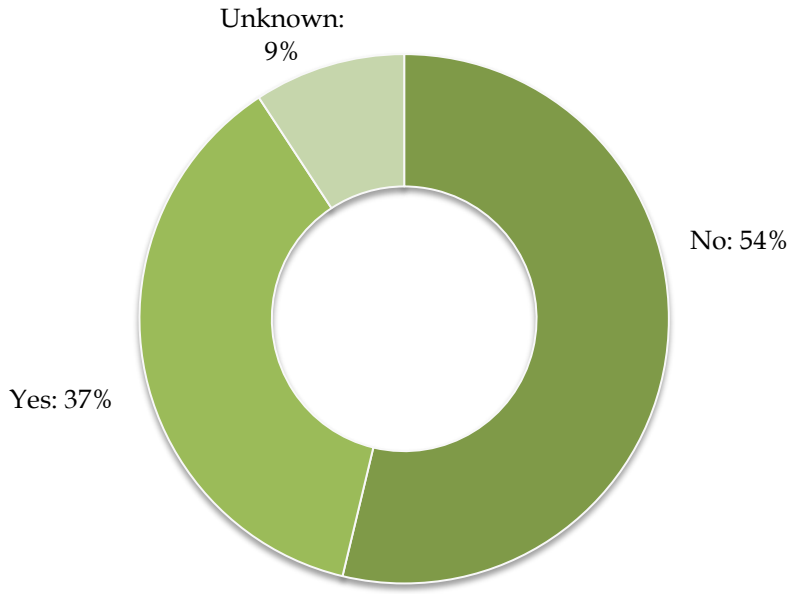


Source: Dataset compiled from LEOKA incident sample.

According to reporting agencies, 37 percent of ambushed officers were aware that the assailant was armed prior to the ambush (see figure 21 on page 54). This has caused some law enforcement officials to question whether these recorded ambushes should in fact be counted as ambush incidents, as the element of surprise is generally a necessary criterion to consider an attack as an ambush (De Groot and Fachner 2013). On the other hand, these may represent incidents in

which the armed offender(s) lured the officer(s) to a location and then executed their assault from a concealed position. To gain a better understanding of these circumstances, we reviewed case summaries for the incidents in which agencies indicated the attack was an ambush and the officer was aware of a potential weapon prior to the attack. The summaries are instructive. For example, one case is described in which an officer responds to a domestic call and calls for backup upon learning that a male suspect is possibly armed and has left the home. The responding officers were fired upon immediately upon arrival. Thus, this incident is classified as an ambush because the responding officers were aware that the suspect was possibly armed, but the suspect attacked without notice or ever being sighted by the officers. Another case summary describes a foot pursuit ending in a suspect hiding behind a wall and shooting the officer to death when approached.

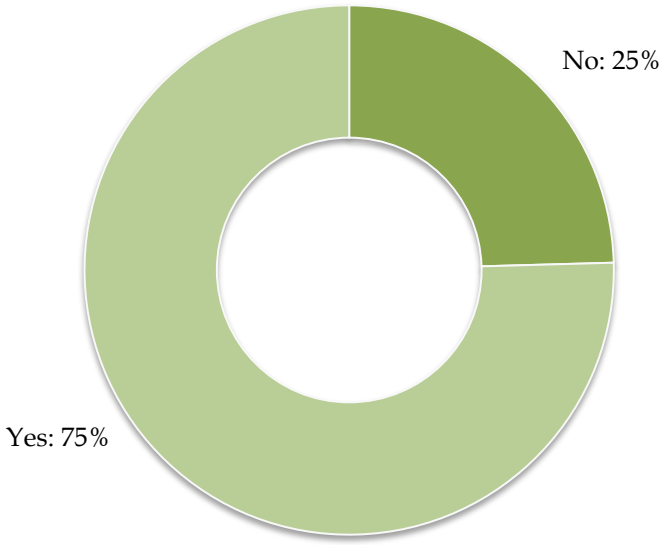
Figure 21. Officer aware prior to attack that assailant might be armed (N=231)



Source: Dataset compiled from LEOKA incident narrative sample.

Seventy-five percent of officers were wearing bullet-resistant armored vests at the time of the incident. The reasons the other 25 percent of officers were not wearing vests vary. For example, it is not surprising that officers serving as detectives or in undercover and special assignments were the least likely to be wearing vests. However, even 16 percent of officers in patrol vehicles were not wearing vests at the time of the incident. Figure 22 on page 55 illustrates the breakdown of all officers, showing that 25 percent of all ambushed officers were not wearing a vest.

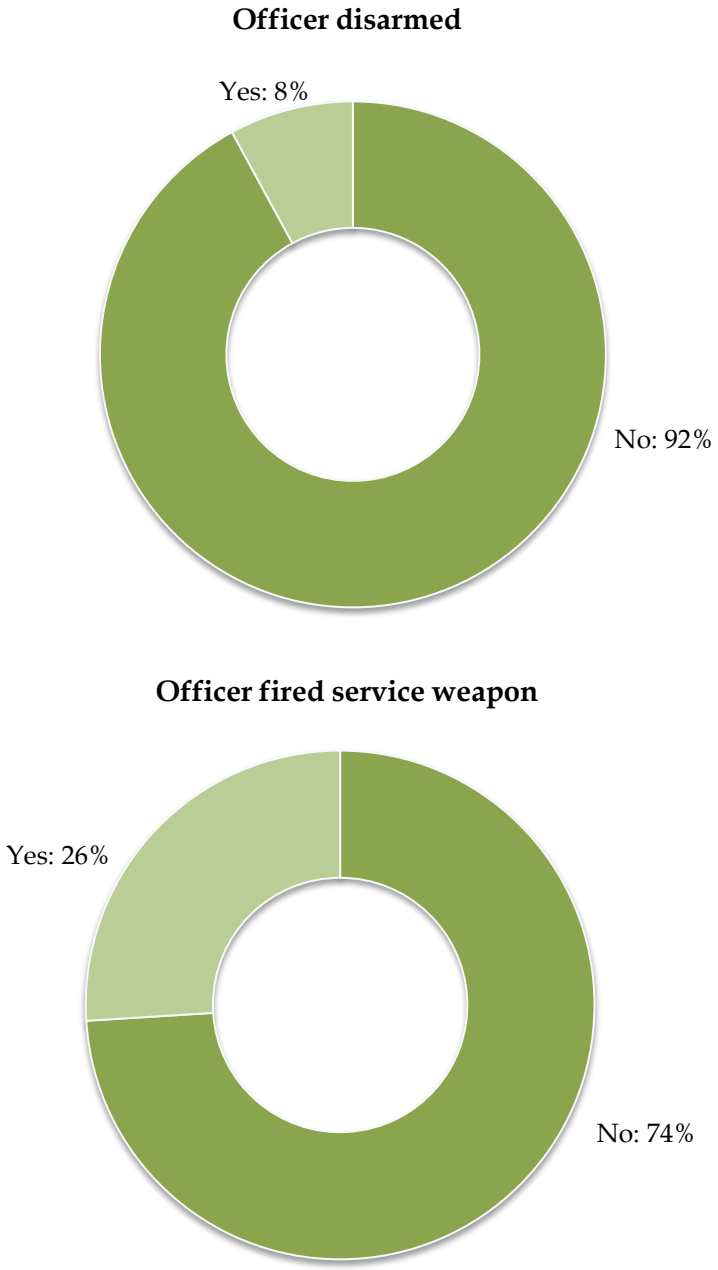
Figure 22. Officer wearing bullet-resistant armored vest (N=231)



Source: Dataset compiled from LEOKA incident sample

As shown in figure 23 on page 56, just 26 percent of officers fired their weapon during the incident. Among those that did so, the number of rounds fired ranged from 1 to 31 with an average of 7.5 rounds. A large majority (92%) of officers kept their firearms and were not disarmed. However, 8 percent of officers were disarmed during the incident.

Figure 23. Officer fired weapon or was disarmed (N=231)



Source: Dataset compiled from LEOKA incident sample

We compared the survival rate of officers who were ambushed by various incident dynamics using the chi-square statistic to determine statistical significance. Statistically significant differences are indicated with a check in the last column of table 16 on page 57. We found that officer survival rates vary significantly according to several incident dynamics. The survival rate for officers was significantly higher (60%) in poor lighting conditions than in fair lighting condi-

tions (42%). Distance also appears to work in the officers' favor. Comparing across five distance categories showed that the survival rate was significantly different in each. Officer survival rates were higher where distance was greater. At 0–5 feet, officer survival rates were just 34 percent. When officers were more than 50 feet away from assailants, two-thirds (67%) survived. Officers who used cover had significantly higher survival rates (69%) than those who did not (40%). Officers who received assistance from another officer were significantly more likely to survive (54%) than those who did not (38%). Vehicles were the least frequently used but most consistently deadly weapons, used to kill two officers. Knife attacks were always survived. Ambushes using firearms were survived 45 percent of the time. Officers wearing body armor survived more than half (53%) of the time, which was significantly more than those without armor (32%). Though relatively few officers were disarmed (N=18), when they were, the likelihood of surviving was the lowest (17%) among all incident factors. Last, officers who fired their service weapon were significantly more likely (68%) to survive than those that did not (40%). Table 16 shows the comparative officer survival rates for each incident dynamic.

Table 16. Officer survivability by incident dynamics

Incident dynamics		Incidents (N)	Survivors (N)	Officer survival rate (%)	X^2	df	Pr	Sig.
Prior assailant-officer relationship	No known relationship	167	78	46.7	2.66	2	0.265	—
	Non-law enforcement	7	5	71.4				
	Law enforcement	41	16	39.0				
Type of establishment	Commercial	46	24	52.2	2.34	2	0.311	—
	Government/ public	61	24	39.3				
	Residential	124	62	50.0				
Location	Outdoors	194	94	48.4	0.34	1	0.561	—
	Indoors	37	16	42.2				
Lighting conditions	Fair	170	73	42.9	5.18	1	0.023	✓
	Poor	60	36	60.0				
Distance	0–5 feet	64	22	34.4	11.72	4	0.020	✓
	6–10 feet	34	14	41.2				
	11–20 feet	43	21	48.8				
	21–50 feet	32	18	56.2				
	More than 50 feet	39	26	66.7				
Officer use of cover	Cover not taken	165	66	40.0	14.86	1	0.000	✓
	Cover taken	61	42	68.8				
Suspect use of cover	Cover not taken	105	44	41.9	2.52	1	0.112	—
	Cover taken	114	60	52.6				

continues

Table 16 (continued). Officer survivability by incident dynamics

Incident dynamics		Incidents (N)	Survivors (N)	Officer survival rate (%)	X^2	df	Pr	Sig.
Officer assist	Officer not assisted	90	34	37.8	5.72	1	0.017	✓
	Officer assisted	141	76	53.9				
Suspect weapon	Firearm	217	98	45.2	15.54	2	0.000	✓
	Knife/sharp object	12	12	100				
	Vehicle	2	0	0				
Assailant's firearm type	Handgun	96	38	39.6	2.04	2	0.360	—
	Rifle	90	42	46.7				
	Shotgun	28	15	53.6				
Officer aware of suspect weapon	Unaware	122	56	45.9	2.51	1	0.113	—
	Aware	84	48	57.1				
Body armor	Not wearing vest	56	18	32.1	7.30	1	0.007	✓
	Wearing vest	172	91	52.9				
Officer disarmed	Officer disarmed	18	3	16.7	7.70	1	0.006	✓
	Officer not disarmed	209	106	50.7				
Officer fired weapon	Fired weapon	168	68	40.5	13.07	1	0.000	✓
	Did not fire weapon	59	40	67.8				

Multivariate ambush survivability analysis

We selected all variables found to be statistically significant in our bivariate analysis, as well as variables often used in previous studies and theoretically relevant to the topic of violence against the police. Our final model included the following explanatory variables.

Officer characteristics. Though none were found to be statistically significant in our bivariate analysis, we included *experience*, *firearms qualifications*, and *defensive tactics training* as our officer variables because they remain theoretically relevant. Officers with more experience and more recent training ought to perform better. Previous research has not identified this link; however, it has not been examined in relation to survivability of ambushes.

Suspect characteristics. Limited data ultimately limit the amount of suspect data we can include in our model. For instance, many of the cases did not have complete data on the suspects' mental health or well-being at the time of the incident. Likewise, whether or not the suspect was under judicial supervision was unknown in nearly 20 percent of cases. *Criminal record*, *prior conviction*, and prior time on *parole or probation* were all found to be significant in our bivariate

analysis. These variables were also highly correlated with one another. Therefore, we chose *prior criminal record to* represent the suspects' prior criminality. It is the most encompassing of the three and is sure to differentiate suspects with prior interactions with the criminal justice system from those without. It also encompasses all suspects with prior convictions and time on parole or probation. Last, it was the most statistically significant ($p < 0.01$) of the three and had the greatest difference in survival rates (–24%) between officers who encountered suspects with criminal records and those who encountered suspects without criminal records. We also included *premeditation* as a theoretically relevant variable, particularly for the topic of ambushes. In theory, preplanning or entrapment should work in the suspects' favor and increase their likelihood of a successful attack where "success" is defined as the death of an officer.

Incident dynamics. We employed all eight incident dynamics found to show significant differences between survived and fatal incidents: *poor lighting*, *distance*, *officer use of cover*, *officer assisted*, *suspect armed with a firearm*, *officer wearing body armor*, *officer disarmed*, and *officer fired service weapon*. We collapsed the distance variable into a single measure indicating whether the distance between the officer and suspect was more than 10 feet.

Table 17 shows the results of our analysis. In total, 187 observations included data on all of our explanatory variables. Note that our unit of analysis is the officer. Therefore, this represents the experiences of 187 officers who were ambushed. Our model is well-fitted ($Pr > X^2 = 0.000$), meaning the variables we selected appropriately explain survivability of an ambush. We describe each set of variables in detail in table 17.

Table 17a. Multivariate ambush survivability analysis

Variable	Odds ratio	Standard error	z	P>|z|	95% Confidence interval	Sig.
Officer characteristics						
Experience (yrs.)	1.03	0.025	1.17	0.243	0.98–1.08	—
Last firearms qualification (mos.)	1.03	0.042	0.73	0.465	0.95–1.11	—
Last defense tactics training (mos.)	1.00	0.011	0.46	0.647	0.98–1.03	—
Suspect characteristics						
Prior conviction	0.47	0.177	-2.01	0.045	0.23–0.98	✓
Premeditation	0.70	0.278	-0.88	0.376	0.33–1.53	—
Incident dynamics						
Poor lighting	2.88	1.160	2.63	0.008	1.31–6.35	✓
Distance greater than 10 feet	2.49	0.98	2.3	0.020	1.15–5.37	✓
Officer use of cover	1.83	0.776	1.42	0.154	0.80–4.20	—
Officer assisted	2.94	1.200	2.66	0.008	1.33–6.54	✓

Continues

Table 17a (continued). Multivariate ambush survivability analysis

Variable	Odds ratio	Standard error	z	P>|z|	95% Confidence interval	Sig.
Suspect armed with firearm	0.06	0.057	-3.11	0.002	0.01–0.36	✓
Officer wearing body armor	3.35	1.636	2.48	0.013	1.29–8.73	✓
Officer disarmed	1.35	1.098	0.37	0.713	0.27–6.65	—
Officer fired service weapon	3.25	1.382	2.78	0.005	1.42–7.48	✓

Table 17b. Model fit overview of table 17a

Model fit parameter	Value
Observations	187
Log likelihood	-99.66
Likelihood ratio for $X^2(12)$	59.90
Probability > X^2	0.0000
Pseudo-R^2	0.2311

Officer factors

Nonfactors. None of our three measures of officer experience and training were found to be significantly related to whether an officer survives an ambush. An officer's years of experience did not impact the survivability of an ambush one way or the other, controlling for all of the other factors in our model. The amount of time passed since an officer's last defensive tactics training and firearms qualification was also not significantly related to the survivability of these incidents.

Lower odds of ambush survivability. No measureable officer characteristics were found to have a negative effect on ambush survivability.

Greater odds of ambush survivability. No measureable officer characteristics were found to have a positive effect on ambush survivability.

Table 18 summarizes the findings on officer characteristics. Characteristics that were not found to be statistically significant are denoted with a dash.

Table 18. Officer factors in survivability

Officer characteristic	Effect on ambush survival odds
Experience (in years)	—
Recentness of defensive tactics training	—
Recentness of firearms qualification	—

Suspect factors

Nonfactors. Whether the suspect had planned the ambush or reacted spontaneously to evade arrest did not have an effect on the survivability or, conversely, the lethality of the assault.

Lower odds of ambush survivability. Officers who encountered a suspect with a criminal record were 0.42 times as likely to survive an ambush as officers who encountered only suspects with no a criminal record. In other words, the officer's odds of survival were 47 percent lower when the suspect had a criminal record.

Greater odds of ambush survivability. No measureable suspect characteristics were found to have a positive effect on ambush survivability.

Table 19 summarizes the findings on suspect characteristics. Characteristics which were not found to be statistically significant are denoted with a dash.

Table 19. Suspect factors in survivability

Suspect characteristic	Effect on ambush survival odds
Premeditation	—
Prior conviction	-47%

Incident factors

Nonfactors. It is surprising that whether or not an officer takes cover was not found to be a significant predictor of survival, nor was the officer's being disarmed, when taken in the context of the full regression model including all other factors.

Lower odds of ambush survivability. That the suspect(s) executed their assault with a firearm was a significant predictor against ambush survivability. Specifically, officers ambushed by a suspect armed with a firearm had survival odds that were 94 percent lower than those of officers ambushed with other weapons. However, it is worth recalling that the vast majority of suspects used a firearm. Ambushes in which the suspect used a motor vehicle as a weapon (N=2) were fatal 100 percent of the time; those in which the suspect used a knife were survived 100 percent of the time.

Greater odds of ambush survivability. Several incident dynamics work in the officers' favor, increasing their odds of survival. Poor lighting, for example, is associated with an increase in survival odds by 194 percent. In other words, officers who were assaulted in dark or poor lighting conditions had a survival rate that was 2.88 times that of officers who were assaulted in the daylight or at an artificially lit scene (e.g., indoors with the lights on). Distance also works in the officers' favor. Having more than 10 feet between the officer(s) and the suspect(s) increased the odds of survival 149 percent. Similarly, officers who received assistance from another officer during the encounter had significantly greater survival odds—194 percent. It is not a surprise

that officers wearing ballistic-resistant vests had 225 percent greater odds of survival than officers without vests. Last, the odds that officers survived were 246 percent greater when they discharged their service weapons.

Table 20 summarizes the findings on incident characteristics. Characteristics that were not found to be statistically significant are denoted with a dash.

Table 20. Incident factors in survivability

Incident characteristic	Effect on ambush survival odds
Poor lighting	+188%
Distance greater than 10 feet	+149%
Officer use of cover	—
Officer assisted	+194%
Suspect uses firearm	-94%
Officer wearing ballistic-resistant body armor	+235%
Officer disarmed	—
Officer fired service weapon	+225%

Discussion

Understanding the factors that influence survival from a systematic and trend-based perspective can be a valuable tool for police agencies. Our analysis sheds new light on the nature and impact of incident dynamics in a violent encounter—specifically a surprise attack. It is not, however, without limitations. First and foremost, this analysis examined a subset of ambush incidents that caused serious injury or death to the officer. We do not know how representative this dataset is of all ambush incidents. In addition, the very nature of these dynamic scenes means that factors will vary in importance from incident to incident. For example, we found that taking cover is generally not significantly associated with survivability of an ambush for the subset of ambushes involving serious injury or death. Obviously, taking cover when it is available is paramount to officer safety and should always be done if possible. What our analysis uncovers is the fact that when other factors are thrown into the mix, taking cover does not make the greatest difference in survivability. Last, our analysis is limited in our understanding of how the incident began and at what point the officer was killed during the attack. Officers who were killed immediately may never have had the opportunity to take cover, return fire, or call for assistance. Therefore, taking those actions can very well be an artifact of surviving as much as they influence survivability. We do not have that level of detail in our dataset. We discuss the broad implications of our findings in this section.

Broadly speaking, the experience and background of officers has no apparent impact on their survivability in an ambush attack. Age, experience, and training that is essential to performance in a surprise attack were all found to be nonfactors. This comports with past research on the topic of officer assaults. In perhaps the most dynamic and potentially dangerous of assaults, officer characteristics also do not appear to play a role.

Officers who are assisted are significantly more likely to survive than those that are alone for the duration of the incident. More than one-third of officers who are ambushed are alone and never receive any assistance. These officers are also more likely to die in the assault. However, most officers receive assistance in an ambush, which improves the incident's survivability. These findings highlight the importance of team coordination and tactics in a dynamic critical incident. It is often the case that multiple officers will be involved in a potentially deadly encounter. Police department policies and training, including dispatch and communications, contact and cover, command and control of a scene, and officer down response, should properly address this reality.

Ambush assailants were generally young, male, criminal, and acting from a position of tactical advantage. The demographic profile of ambush assailants shows a largely male population that is significantly younger than the police they assault and most of whom have some previous interaction with the criminal justice system. In fact, one in five had some previous interaction with the particular officer they ambushed. Although it was not shown to significantly impact officer survival rates, it is worth highlighting the fact that assailants were often tactical, using cover in nearly half of officer ambushes. Furthermore, assailants often outgunned officers, using rifles nearly as often as handguns in their assaults.

Ambushes are survivable, and officers can take direct action during the incident that significantly improves their odds of survival. A slight majority of ambushes occurred in residential locations, and a large majority occurred outside rather than inside. However, no location was found to be particularly advantageous to the officer or to the assailant. Our analysis showed that most ambushes occurred in daylight or at least in artificial lighting. Yet poor lighting appears to work in the officers' favor. Given this finding, training programs may consider further exploiting this advantage by designing scenarios for nighttime and dimly lit environments. Our analysis also showed that distance increases the odds of survival. Police training programs may consider incorporating this reality into their scenarios and training officers that creating distance may be an appropriate tactical response. Last, officers who fired shots at their assailants were significantly more likely to survive.

Ballistic vests save lives. One-quarter of officers, including those in a patrol function, were not wearing ballistic vests at the time of their assault. Many police departments throughout the country still do not have mandatory vest policies for their officers despite an abundance of reason and science that demonstrates that they save lives.

Chapter 5. Organizational Learning from Police Ambushes

Introduction

How do police organizations learn in the wake of critical incidents? One of the best-known responses in the aftermath of such an incident is to produce an after-action report. Sometimes completed internally and sometimes with the help of outside experts, after-action reports generally reconstruct and analyze the incident with the goal of identifying mistakes, lessons learned, and best practices. Often a series of recommendations is included in the final report. Such reviews are beneficial to the police department as well as to the greater law enforcement community. In some agencies this type of process is routine, while in others it is conducted on an ad-hoc basis. To date, there has not been any research that captures the state of organizational learning (whether through an after-action report or another process) from critical incidents in police departments. This chapter presents the findings from an original survey on the topic of organizational learning in the wake of an ambush assault. Specifically, it answers the following research question: **Do police agencies engage in systematic, organizational learning processes as the result of ambush incidents**?

In the following sections, we provide an overview of our survey procedure, method of analysis, and findings from our survey. Our findings describe the prevalence of incident reviews among agencies that have encountered ambushes and the scope, participation, and outcomes of those reviews.

Data

We designed a short survey of 14 questions, in addition to subquestions, about the response to specific ambush incidents that occurred within each police agency respondent. In all the survey consisted of 124 data points. Questions sought the following information:

- Type of engagements with community following the incident
- Interagency coordination
- Critical incident review practices (in addition to criminal investigations)
- Scope of critical incident review
- Participants of critical incident review
- Policy changes in the wake of the incident
- Training changes in the wake of the incident
- Deployment strategies in the wake of the incident
- Equipment changes in the wake of the incident

Our sampling frame was derived from state and local agencies reporting injurious and fatal police ambushes to LEOKA from 2004 to 2011.[11] This accounted for a population of 133 agencies. We sent all police agencies an invitation, addressed to the chief of police, to participate in the survey and followed up with as many as three reminders, including e-mailed reminders to those departments for which a public e-mail address was available. Respondents were given the option to complete the survey online or on paper. A total of 36 percent of agencies (N=48) responded to our survey.

Sample characteristics

Our sample of ambush incidents came from a diverse collection of police agencies. We present characteristics of the agencies in our sample here to inform the reader of where the agencies that responded to our survey are situated.

Among our respondents, 37 percent were from county law enforcement agencies, 54 percent were municipal, and about 8 percent were state agencies. This closely mirrored the agencies from our population, of which 37 percent were county, 56 percent were municipal, and 8 percent were state law enforcement agencies. In terms of jurisdiction size, smaller jurisdictions (serving populations of less than 10,000) were underrepresented among our respondents, and larger jurisdictions (serving populations of more than 100,000) were overrepresented. Table 21 summarizes the relative sizes of jurisdiction sizes served by agencies in our sample.

Table 21. Samples characteristics compared with national

Population served	Percent in sample	Percent in population
< 10,000	4.2	12.0
10,000 to 99,999	41.7	45.1
≥ 100,000	45.8	35.3
State agency	8.3	7.5

Method

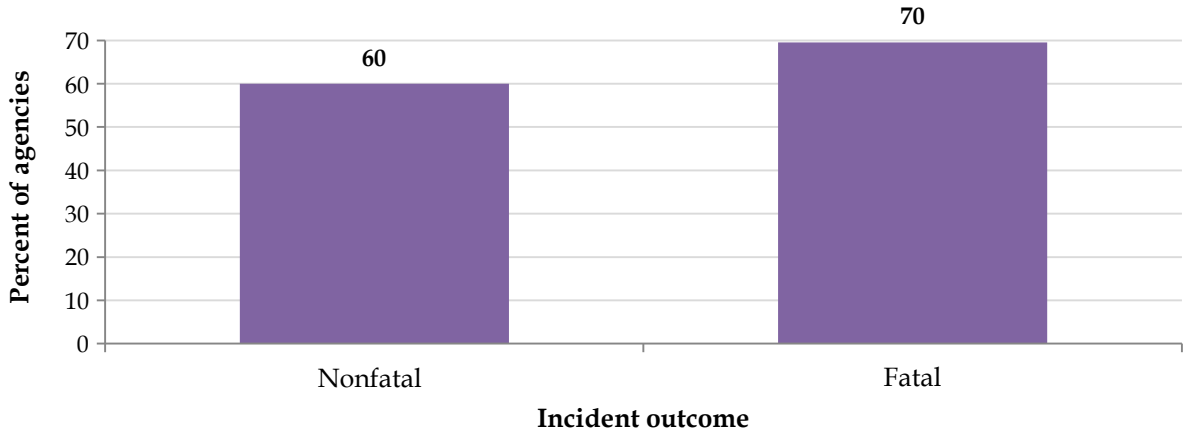
This chapter presents descriptive trends of survey results that indicate the prevalence and nature of organizational learning processes that take place in police agencies in the wake of an ambush. We identify common and uncommon characteristics of the process, including scope, participation, and outcomes.

[11] Note: One agency in our sample had encountered an ambush in 2014 and provided responses based on that incident.

Results

Among survey respondents, 65 percent (N=31) conducted a critical incident review of the ambush. Incidents that resulted in fatalities were more likely to lead to a critical incident review, though the differences were not statistically significant ($x^2 = 0.479$, $p = 0.50$) (see figure 24). Exactly how the review was conducted varied. Many agencies described a debriefing of the involved officers after the incident, while others described the convening of a formal review board. The common feature, however, was that agencies reviewed the incident in some capacity from a noncriminal, learning perspective.

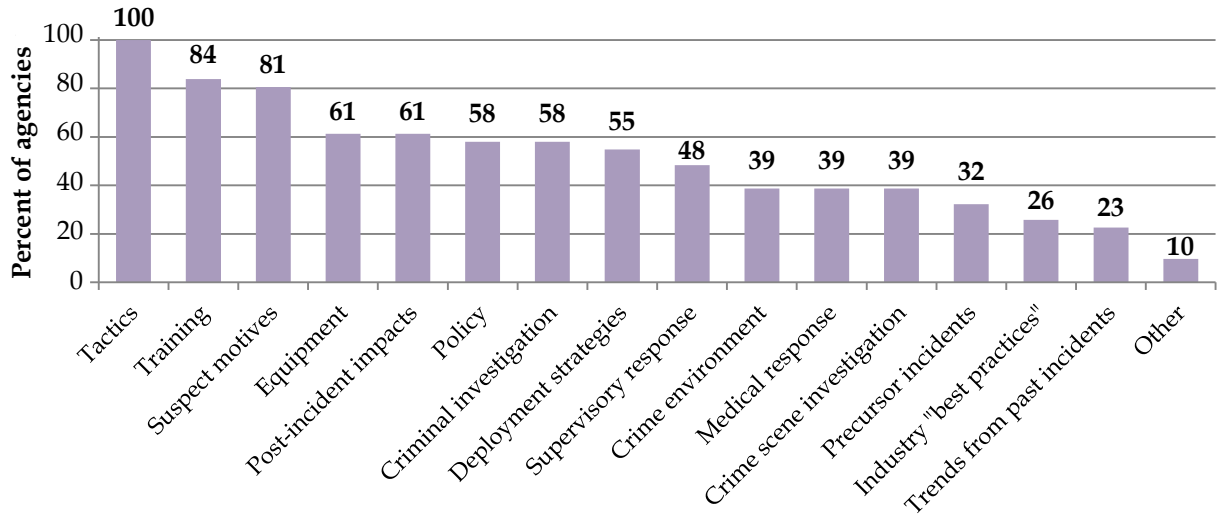
Figure 24. Agencies conducting critical incident reviews of ambush incidents



Source: Survey data

Every agency that conducted a critical incident review had officer tactics within their scope of review. The second most common review elements were training (84%) and suspect motives (81%). Roughly 60 percent of agencies reviewed equipment usage and needs, post-incident impacts, policies, and the criminal investigation. Fifty-five percent of agencies reviewed their deployment strategies. Fewer than half of agencies reviewed the remaining topics, the least frequent industry best practices (26%) and trends from past incidents (23%). Figure 25 on page 67 shows the complete distribution of topics addressed in critical incident reviews.

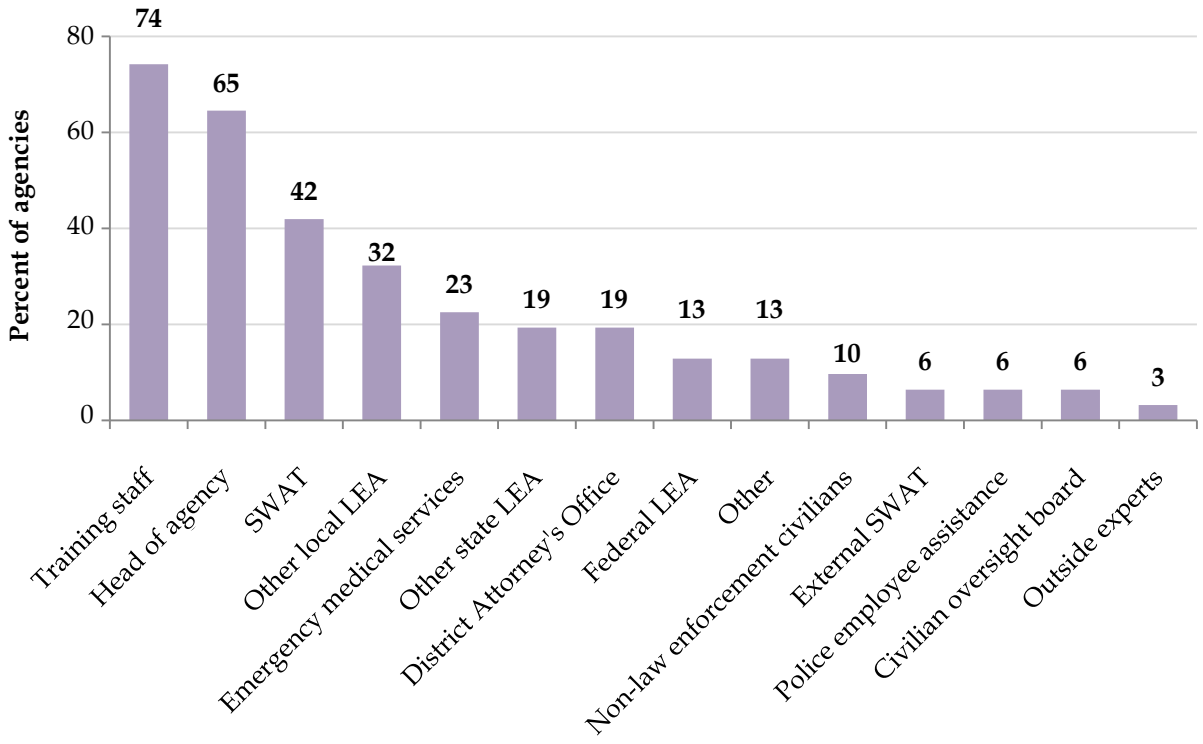
Figure 25. Scope of ambush critical incident reviews



Source: Survey data

Stakeholder participation varied greatly. The most common (74%) entity involved in critical incident reviews was training staff. The head of the agency was involved 65 percent of the time. The remaining entities participated in reviews for less than half of the incidents. Among the remaining entities, SWAT was the most frequent (42%) stakeholder. In nearly a third of cases, another local law enforcement agency participated in the review. The least frequent participants were outside experts, having participated in reviews for 3 percent of incidents. Figure 26 on page 68 shows the frequency with which each type of stakeholder participated in critical incident reviews.

Figure 26. Stakeholder participation in ambush critical incident reviews



Source: Survey data

The number of different stakeholders participating in critical incident reviews varied from just one to as many as nine. Most reviews included two or three types of stakeholder, together accounting for about 51 percent of all incident reviews. Table 22 shows the complete breakdown of the number of stakeholder types participating in critical incident reviews.

Table 22. Number of stakeholders participating in critical incident review

Number of stakeholder entities	Percent
1	13
2	23
3	29
4	6
5	16
6	6
7	3
9	3

Results from our survey show that in the wake of the ambush, agencies institute changes in policy, training, deployment strategies, and equipment. This was true for agencies that conducted a critical incident review and those that did not. Across all agencies that encountered ambush incidents, 12 percent implemented a change in policy, 33 percent implemented new training, 17 percent changed their deployment strategy, and 23 percent procured new equipment. Few agencies provided detailed information on the changes. We list some notable changes as the result of incidents here (by listing these policy changes, the authors do not intend to endorse them).

Respondents reported the following changes in policy:

- Tracking violent offenders in computer aided dispatch systems
- Creating a policy related to first aid
- Creating a policy for directed cover fire

Respondents reported the following changes in training:

- Ambush-specific training
- Officer approach to vehicle and tactical positioning
- First responder first aid
- Training bulletin on ambushes
- Active shooter response training

Respondents reported the following changes in strategy:

- Two officers being dispatched to hang-up 911 calls
- Development of an active shooter strategy

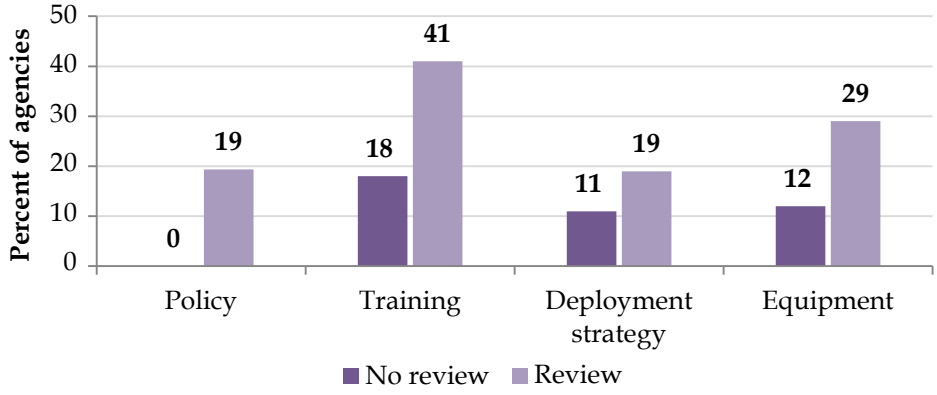
Respondents reported the following changes in equipment procurement and use:

- Ballistic helmets
- Ballistic shields
- Tourniquets
- First aid kits
- Patrol rifles
- Armored vehicles

Comparing across agencies that did and did not conduct critical incident reviews shows some patterns in their response to reform (see figure 27 on page 70). Only agencies that conducted a critical incident review reformed policy as a result of the incident. The difference in policy changes between reviewing agencies and nonreviewing agencies was statistically significant ($x^2 = 3.76$, $p = 0.05$). Changes in training were much more likely to occur in agencies that conducted a critical incident review (41%) compared to those that did not (18%); the difference approached statistical significance ($x^2 = 2.90$, $p = 0.08$). Deployment strategies were also more

common in reviewing agencies (19%) than nonreviewing agencies (11%), though the difference was not statistically significant (x^2= 0.45, p = 0.50). Last, agencies that conducted a critical incident review were more likely to procure new equipment (29%) than those that did not (12%), but the difference was not statistically significant (x^2 = 1.85, p = 0.17).

Figure 27. Police reforms in the wake of an ambush



Source: Survey data

Discussion

Our survey provides a first look at the organizational learning practices of police agencies that have encountered critical incidents—specifically ambushes. In one sense, it demonstrated that police agencies are often self-critical, learning organizations, as a majority of agencies engaged in some specialized review of the incident. Even nonfatal incidents are often taken seriously and reviewed as opportunities to learn.

Although organizational learning appears to be common, we see that the review's formality, scope, and participation vary greatly. Tactics, training, and suspectology were the most common topics addressed. Markedly missing from most review processes was research on trends and best practices and the inclusion of outside experts. And while it appears that agencies that conduct a critical incident review are more likely than agencies that do not conduct such a review to change some aspect of their operations as a result, the nature and magnitude of those changes varies from training bulletins to the procurement of armored vehicles.

Moving forward, the field will benefit from a greater understanding of the impact that review boards, broad stakeholder participation, and a widened scope of critical incident review can make on police organizational learning and subsequently on police reform.

Conclusion

Over time, much research, analysis, and thought has been given to violent encounters involving the police, including assaults against the police, injuries, felonious deaths, use of force, and officer-involved shootings. Much less attention has been given to what has become a growing concern amongst law enforcement—that is, ambush-style assaults. While concern has grown, all available evidence shows that officer felonious deaths and assaults generally have been declining since the crime wave began subsiding in the latter part of the 1990s. As time passes, researchers, policymakers, and journalists alike will no doubt continue to monitor these trends for any remarkable changes.

This report provides an empirical foundation for learning about the nature of these attacks, where they occur, and how they can be survived. Through a series of analyses, we uncovered several descriptive trends in the environment, incident dynamics, and aftermath of ambush assaults against law enforcement.

We found that violent crime and violence against the police significantly correlate with ambushes against police at the jurisdiction level, indicating that violence begets violence and that areas where crime is high and assaults against police are high may be more prone to severe attacks such as ambushes. We also found that organizational characteristics one would expect to engender better community relations and therefore reduce the number of ambush assaults were actually associated with higher levels of ambush assaults, highlighting the fact that there are no panaceas for police-community tranquility. Related to police agency organizational traits, we found that progressive hiring practices and standards were associated with lower numbers of ambushes. Last, we found that technology, specifically in-car cameras, significantly lowers ambush assaults, highlighting a potential deterrent effect on both officer and citizen behavior.

While environmental conditions may be more or less conducive to ambushes, it is also important to recognize that an ambush is a tactic, not necessarily a mindset. In this sense, it is important to study ambushes from a tactical perspective. Our survivability analysis uncovered several incident dynamics that officers may use to their advantage if caught off guard and attacked including calling for assistance, creating distance, leveraging poor lighting conditions, and returning fire.

Police leaders are grappling with this topic and recognize the important balance of preparing officers for what could be the worst day of their life and ensuring they have an appropriate balance between the guardian and warrior mindsets. Reality-based training provides an environment in which officers can learn and hone a host of skills ranging from verbal communication to de-escalation to tactical response in a surprise assault.

Police leaders also recognize the importance of learning from these incidents. Focus group participants nearly universally agreed that more critical incident analyses need to be conducted and shared amongst the field. Our survey of agencies found that many in fact do conduct some sort of critical incident analysis, but they tend to be limited in scope and participation.

An agenda for action and research

Future research and development should build upon the findings and limitations of this report and improve our understanding of how these incidents unfold, their outcomes, and the effectiveness of efforts to protect and respond to such incidents.

The U.S. Department of Justice should clearly define ambush in their annual collection of officer assault data. At present, departments are only permitted to choose one of many scenarios to describe the event (e.g., traffic stop, burglary, ambush); yet assault incidents are more dynamic and may involve more than one event description. For example, the "traffic stop ambush" is a common topic of police training and literature, but the current system of data collection does not allow an agency to select an event as both a "traffic stop" and an "ambush." Furthermore, the law enforcement community must come to a consensus on how ambushes are to be defined and which criteria must be met. The debate over spontaneous versus entrapment ambushes must be settled in order for proper accounting of these incidents in the future.

More research is needed on the impact of law enforcement philosophies and operations on violence against the police. Law enforcement agencies need to understand whether their policies and procedures could inadvertently create unsafe conditions for both the public and the police and how to reform those practices to better engender trust and partnership between the department and the community writ large. Researchers should carefully examine incidents and conditions that contribute to extreme violence against the police, looking at both spatial and temporal dimensions. Mixed-method case studies that incorporate in-depth interviews, reviews of investigative case files, departmental policies and procedures, and hard data on assaults against officers and uses of force can be particularly illuminating.

Organizational learning through systematic critical incident reviews should be institutionalized throughout the law enforcement field. The concept of sentinel events learning has gained much traction in the criminal justice field (National Institute of Justice 2014; President's Task Force on 21st Century Policing 2015). Sentinel events learning acknowledges that unexpected negative outcomes signal underlying weaknesses in a complex system or process. Applying this concept to ambushes of police would encourage law enforcement agencies to look broadly at the precursor factors leading up the incident of the ambush itself and result in an action plan to prevent the recurrence of the incident.

Reality-based training is the best way law enforcement can prepare and evaluate officers in handling high-stress events such as a surprise attack. To the extent that training replicates real life, it replicates the officers' physiological response to the event (Meyerhoff et al. 2004). There-

fore, officer performance in reality-based training is the closest an agency can get to observing and evaluating performance during a real-life critical incident in real time and in a controlled environment. Given the relatively low frequency of real-life critical incidents, these exercises are an invaluable opportunity for the department to learn about itself and the readiness of its officers. Law enforcement agencies should work toward the development of reality-based training programs. To address officer performance and survival in ambushes, training modules could incorporate the elements uncovered from the current study of over 100 past incidents, including the following:

- Suspect use of cover
- Officer use of cover
- Lack of cover
- Responding to assist on a hot scene
- Outdoor and indoor locations
- Making advantageous use of dimly lit areas
- Tactical retreat and creating distance
- Applying first-aid, including self-application of first aid

The U.S. Department of Justice, police agencies, and policy and research institutions should commit resources to the development and validation of training and tactics that protect officers in the event of serious assaults, including ambushes. The criminal justice community has come a long way in terms of building evidence on crime prevention strategies through rigorously designed studies; this level of commitment, resources, and effort, however, has been largely lacking when it comes to officer safety and tactics. Recent research has demonstrated that reality-based training is primed for experimenting with officer safety and tactics. Studies using reality-based training should seek to replicate findings from the past work of ALERRT and Force Science, in addition to building new evidence for effectiveness in tactical approaches.

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About the COPS Office

The Office of Community Oriented Policing Services (COPS Office) is the component of the U.S. Department of Justice responsible for advancing the practice of community policing by the nation's state, local, territory, and tribal law enforcement agencies through information and grant resources.

Community policing is a philosophy that promotes organizational strategies that support the systematic use of partnerships and problem-solving techniques to proactively address the immediate conditions that give rise to public safety issues such as crime, social disorder, and fear of crime.

Rather than simply responding to crimes once they have been committed, community policing concentrates on preventing crime and eliminating the atmosphere of fear it creates. Earning the trust of the community and making those individuals stakeholders in their own safety enables law enforcement to better understand and address both the needs of the community and the factors that contribute to crime.

The COPS Office awards grants to state, local, territory, and tribal law enforcement agencies to hire and train community policing professionals, acquire and deploy cutting-edge crime fighting technologies, and develop and test innovative policing strategies. COPS Office funding also provides training and technical assistance to community members and local government leaders and all levels of law enforcement. The COPS Office has produced and compiled a broad range of information resources that can help law enforcement better address specific crime and operational issues, and help community leaders better understand how to work cooperatively with their law enforcement agency to reduce crime.

- Since 1994, the COPS Office has invested more than $14 billion to add community policing officers to the nation's streets, enhance crime fighting technology, support crime prevention initiatives, and provide training and technical assistance to help advance community policing.
- To date, the COPS Office has funded approximately 125,000 additional officers to more than 13,000 of the nation's 18,000 law enforcement agencies across the country in small and large jurisdictions alike.
- Nearly 700,000 law enforcement personnel, community members, and government leaders have been trained through COPS Office-funded training organizations.
- To date, the COPS Office has distributed more than 8.57 million topic-specific publications, training curricula, white papers, and resource CDs.

COPS Office resources, covering a wide breadth of community policing topics—from school and campus safety to gang violence—are available, at no cost, through its online Resource Center at www.cops.usdoj.gov. This easy-to-navigate website is also the grant application portal, providing access to online application forms.

Ambush attacks against law enforcement officers remain a threat to officer safety with the annual number of attacks holding steady since a decline in the 1990s and the proportion of fatal attacks on officers attributable to ambushes increasing. Concerns about targeted violence against police are rising in an era of strained community relations, struggles with police legitimacy, and anti-government extremism. Yet little research has examined ambush attacks as a specific and directed form of violence against police. This study addresses that gap in the literature through a mixed-methods examination of ambush attacks against law enforcement. Its four major lines of inquiry are qualitative analysis of police perspectives on ambushes, analysis of ambush attack incidents and survivability, investigation of the community and departmental characteristics associated with ambush attacks, and a survey of organizational learning practices in the aftermath of ambushes. This represents the first substantive research in 30 years focused on civilian ambush attacks on police and presents recommendations for next steps and additional research.

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