

# To Save Lives and Property: High Threat Response

Michael Marino, John Delaney, Paul Atwater, Reed Smith

## ABSTRACT

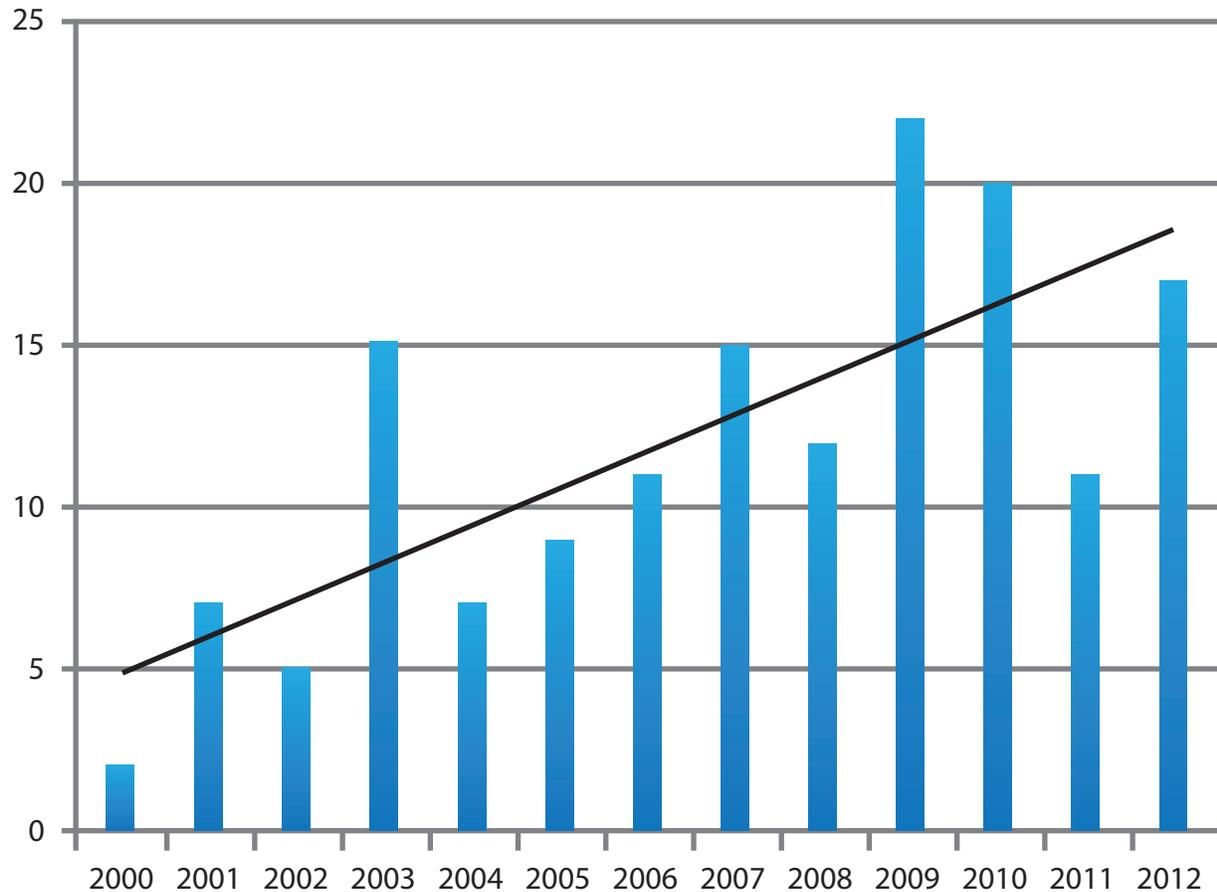
*The emergency services community must recognize that the world is constantly changing and adjust accordingly. It will have to be more nimble and proactive with its capabilities if it wants to prepare effectively for future threats and respond to atypical emergencies. Over the past several years, fire, law enforcement and emergency medical services communities have not adapted their missions or capabilities to prepare, train, and respond effectively in a joint capacity to perhaps the two most imminent, nonconforming threats facing communities across America – the active shooter and fire as a weapon. These are incidents that necessitate an integrated response; traditional single agency “stove piped” responses will not be effective in saving lives and property. If we do not integrate Fire/EMS and law enforcement capabilities for these imminent threats, not only will civilian lives be lost, but those of first responders will be as well.*

## INTRODUCTION

Fire fighters face the risk of being hurt, injured or killed responding to community-based emergencies throughout the United States. Whether responding to a hazardous materials incident, medical emergency or a structure fire, fire fighters take an oath to save others and in doing so often risk their own lives. Since the 1960s the fire service has gradually expanded its mission and scope of service most notably to include emergency medicine in the 1960-70s.<sup>1</sup> This was then followed by hazardous materials response in the 1980s.<sup>2</sup> Technical rescue came to fruition as a discipline in the 1990s, while weapons of mass destruction and homeland security consequence management added additional mission sets in the 1990s and post 9/11.<sup>3</sup>

While the fire service has a tradition of expanding its mission to meet the needs of the community, the change has been more reactive than proactive and slow to evolve. The clearest example of this is the September 11th and anthrax attacks of 2001. The fire service was woefully unprepared for these events. The fire service tends to be bound by tradition which can weigh down progress and must adapt its mission to the threats and needs of this rapidly changing, more interconnected world. The fire service will have to be more forward leaning in developing its capabilities if it wants to prepare effectively for future threats and respond to atypical emergencies. Over the past several years, the fire service has not adapted its mission or its capabilities to prepare, train, and respond effectively to perhaps the two most imminent, nonconforming threats facing communities across America: the active shooter and fire as a weapon.

Over the past several years, there have been numerous national and international incidents that have required a combined law enforcement, fire, and EMS response.<sup>4</sup> These tragic events necessitated operational personnel to perform novel tactics to mitigate threats that required a multidisciplinary response. International terrorist organizations and criminals have utilized fire and firearms to evoke fear in communities, regions and nations.<sup>5</sup> Intelligence reporting has indicated that these types of complex attacks are being considered by terrorist organizations, and as a whole, the emergency response community is not prepared to handle these events effectively.<sup>6</sup>



**Figure 1.** Trend Line shows increase in number of Active Shooter Incidents from 2000-2012<sup>7</sup>

Both active shooter and fire-as-a-weapon incidents require combined fire, EMS, and law enforcement response. Preparing for these types of emergencies will require a fundamental shift in mission space for these aforementioned agencies. Traditional single agency “stove piped” responses will not be effective in saving lives and property as pointed out by Douglas Weeks.

The utilization of conventional means and methods against an unconventional threat is akin to putting a square peg in a round hole; although it might work in some circumstances, it is rarely a very good fit. This square-peg, round-hole idea exists because conventional practices were never developed with the flexibility, operational scope, and complexity required to manage the threat of terrorism.<sup>8</sup>

If we do not integrate Fire/ EMS and law enforcement capabilities for these imminent threats, not only will civilian lives be lost, but first responders will suffer as well. Our fire service leaders have a duty to prepare and train for these events simply based on the threat; these events are possible in any community.

### **THE ACTIVE SHOOTER**

The mass killings in Aurora, Colorado (2012) and Newtown, Connecticut (2012) continue to bring to light the real risk and absolute horror of what both the law enforcement and Fire/ EMS responders must be prepared to face. Events such as these have spawned federal initiatives and calls for action to control lethal weapons and improve mental health resources.

Yet, amongst all of the rhetoric for change, there is only now dialogue regarding the pre-hospital medical response to these events, and how and where improvements and progress can be made.

The law enforcement community changed their tactical response paradigm to active shooter and mass killing events after the tragedy at Columbine in 1999. Prior to that seminal event, the standard law enforcement response to active shooter and mass killing events was based upon the “5 Cs”: contain, control, call SWAT, communicate with the perpetrator, and come up with a tentative plan. Based upon the concept that these events were actually hostage barricades and that the perpetrator(s) did not have a specific intent to kill, the initial patrol response was to create a hard perimeter around the incident site, evacuate those who could be evacuated easily, and establish communications with the perpetrators while waiting for the special tactical response assets to arrive. By the standards of the time, the law enforcement response to the Columbine High School massacre was sound, and considered to be completely consistent with the established doctrine.

However, after Columbine, public and professional criticism of the tactical response began the process of introspection in the law enforcement community. A significant driver for that introspection came as a result of the Columbine Review Commission. Established by Governor Bill Owens after the event, the summary report observed that during “the 46 minute rampage... to the commission’s knowledge, no efforts were made to engage, contain, or capture the perpetrators.”<sup>9</sup> The resulting commission recommendations included, “law enforcement policy and training should emphasize that the highest priority of law enforcement officers, after arriving at the scene of a crisis, is to stop any ongoing assault” and that “all officers... should be trained in the concept and skills of rapid emergency deployment.”<sup>10</sup> Additionally, police research that was published during the time after Columbine demonstrated that a single unchallenged shooter could acquire, target and shoot a new victim about every 5 seconds.<sup>11</sup>

Therefore it stands to reason that the faster the active threat is mitigated, the lower the rate of casualties will be.

The rapid deployment model was based on the idea that reducing ‘trigger time’ would reduce the number of casualties that are incurred.<sup>12</sup> Research by the SEALE Police Academy demonstrated that aggressive action was the most effective countermeasure in stopping the active shooter, even if it is only a single individual.<sup>13</sup> This was shown to be the case in the 1998 shootings at Thurston High School in Oregon.<sup>14</sup> This principle was demonstrated again in 2011 when unarmed civilians in Tucson, Arizona helped end an active shooter incident.<sup>15</sup>

As a result of the public outcry, the Columbine Commission’s clear criticism, and law enforcement research, the accepted standard operational law enforcement response to the active shooter was changed from a ‘surround and wait’ model to one of rapid deployment of the first arriving patrol officers on the scene with the objective of immediately engaging and mitigating the on-going violence. Instead of waiting for highly trained and outfitted SWAT teams, the first arriving patrol officers are now expected to form contact teams immediately and move aggressively to contain or eliminate the shooter. Using impromptu intelligence from victims and persons evacuating, these teams bypass locked doors and move towards the sound of shooting.

Ironically, this rapid response model was not completely new to the law enforcement community as it had been successfully utilized, albeit in an unprepared and impromptu fashion, during prior active killing events. A rapidly assembled team of two Austin police officers and a maintenance man ended the Texas Clock Tower incident of 1968.<sup>16</sup> The Luby’s Restaurant massacre in 1991 was also ended by a rapid police response. Despite the gunman having more ammunition and many victims nearby, police officers responding to the shooting exchanged fire with him, forcing him to retreat into a bathroom where he ended his own life.<sup>17</sup> However, it took the watershed event of Columbine along with the accompanying criticisms of the response, to finally change the police response paradigm.

## Applying Lessons Learned to Fire and EMS

When considering the change in law enforcement tactics and culture, more important than the recognition of an operational gap and the resulting shift in active shooter tactics was the rapid culture change and acceptance of the new response model in the law enforcement community. After Columbine, not only did law enforcement leaders learn from their mistakes, but the average patrol officer readily agreed to accept more personal risk in response to these events.<sup>18</sup> The mission of confronting an active shooter, which was once reserved for specially selected and highly trained tactical personnel, had now shifted to the responsibility of patrol officers.<sup>19</sup>

The Fire/EMS medical response paradigm to such events, however, has not evolved to meet the threat. Although recent shootings have begun to clearly demonstrate the Fire/EMS response gap, the impetus for reactive change may not be at critical mass yet. To date, there has not been a truly seminal event in the public realm to bring harsh criticism on the shortcomings of the current Fire/EMS response protocols for active shooter events.

### Current Practice: the Stage-and-Wait Paradigm

At the heart of the longstanding Fire/EMS paradigm to high threat events is the concept of staging assets safely off-scene until the scene can be declared “safe” by law enforcement. For perspective, at Columbine, this took several hours of slow, methodical searching of the building despite the shooters lying dead in the library after 45 minutes.<sup>20</sup> In fact, Coach William David Sanders, the only teacher to be killed in the shooting, initially survived his wounds, but bled to death over the three hours it took for SWAT teams to evacuate him. This was made all the more salient by the fact that the students in the room with him posted a sign in the outside window, clearly visible to the responding tactical teams, that read, “1 bleeding to death.”<sup>21</sup>

From a medical perspective, ‘stage and wait’ will likely increase the mortality rate in these events. After extensive review of combat medical data, the military changed its paradigm of response in the 1990s to one that is designed to place stabilizing medical care at the patient’s side within a “few seconds to minutes of wounding”.<sup>22</sup> Combat medical data shows that in penetrating trauma there is a predictable death curve where the majority of fatal combat injuries die within 30 minutes of wounding. In the Wound Data and Munitions Effectiveness Team (WDMET) study after Vietnam, it was concluded that in combat, 42% of deaths occur immediately, 26% occur within 5 minutes, 16% within 30 minutes, and 8-10% within 2 hours. Only 10% of all of the combat deaths studied occurred once medical care had been initiated; 90% of deaths occurred prior to any medical care.<sup>23</sup>

In a common sense summary of the data, every minute with uncontrolled injury increases the death rate, so rapid application of medical stabilization of the wounded is lifesaving. The primacy and effectiveness of this ‘point of wounding’ care continues to hold true when reviewing all of the current combat medical data. Given this, in the current War on Terror (WOT), the operational medical emphasis is on training every combat soldier, not just those designated as medics, in simple basic lifesaving skills to be applied as soon as tactically feasible followed by rapid evacuation to care. As with the idea of rapid tactical police response to end the on-going killing, the medical concept of rapidly applied care seems to be intuitive: the sooner the first responders initiate rescue and treatment of the wounded, the greater the chance that the victims will survive.

Often advanced in support of the stage-and-wait paradigm is the notion that the operation, at least until scene security can be established, should belong to law enforcement, and that law enforcement personnel could and should be used to evacuate the wounded out to the staged Fire/EMS personnel. This argument is supported by some law enforcement agencies citing logistical and operational strain and some posit that they are unable to train their patrol officers in escorted Fire/EMS operations. They

often cite a lack of finances, training, and most disturbingly, a lack of confidence in the ability of their local Fire/EMS personnel to work in areas of higher risk.<sup>24</sup>

There are several issues that arise with the model of exclusive primary rescue by law enforcement. The first and foremost is that law enforcement personnel have a tactical, not a rescue or medical mission. In the current response model, all law enforcement response personnel are trained to “go to the sound of shooting” including stepping over and around injured victims. The main objective in tactical active shooter response hinges on immediately stopping the violence and securing the scene, both of which require multiple personnel and tactical objectives. This doesn’t even begin to account for the personnel requirements for scene preservation and evidence collection. Clearly, law enforcement bears a heavy burden in the response to an active shooter.

Law enforcement officers are a limited resource, and should not be required to be the only response asset to initiate rescue and medical operations. Even with a maximal response by law enforcement personnel, in a scenario with high numbers of casualties, the likelihood of having the required numbers to complete the immediate tactical objectives as well as to stabilize and evacuate the wounded is highly unlikely. This means that in systems where either law enforcement or Fire/EMS rejects the idea of coordinated medical operations in areas of higher risk, there will be wounded that continue to lie, and continue to die, while the primary tactical objectives are addressed.

Additionally, unless specifically trained and carrying the proper equipment, the vast majority of law enforcement officers are unable to provide even basic medical stabilization of the wounded prior to evacuation. This means that the injured victim who is exsanguinating rapidly from a thigh wound will continue to exsanguinate during evacuation by law enforcement from the point of wounding to the ‘safe’ area where medical assets are staged. Keeping medical personnel out of the Indirect Threat (Warm) zone means that little treatment is being provided to the wounded, and that

stabilizing and often lifesaving care will be significantly delayed.

### **Balancing Risk and Need**

There are many common arguments against change in Fire/EMS response to active shooting/active killing events. Typically, the default argument against the early deployment of Fire/EMS assets is based upon the idea that operating in an unsecured environment represents too much risk for the responders to assume and that scene safety is paramount above all other considerations. The concept of scene safety is one that is ingrained in all fire and EMS personnel from the earliest stages of training. Based on the idea that most Line of Duty Deaths (LODD) and injuries occur as a result of errors or oversights during routine operations, the scene safety paradigm has been continually reinforced by fire service initiatives to keep preventable injuries and loss of life in responding personnel to a minimum. However, a gap becomes apparent when this paradigm is applied to the active shooter and fire as a weapon threat scenarios. Essentially, first responders gain greater safety at the expense of injured civilians in need of rescue. In complex high threat scenarios, this policy of absolute scene safety for first responders prohibits mitigated risk acceptance.

Risk comes in many forms for the Fire/EMS service, and there may be an inconsistency in the thought process that allows acceptable risk in some scenarios but not in others. There is great risk to the well-being of the responder in every fire that is fought. In 2011 81 firefighters lost their lives in Line of Duty Deaths (LODD): 28 on-scene on an active fire, 20 after the fire, and 8 while responding.<sup>25</sup> Statistics show that on the average, 80-100 firefighters die in the performance of their duties every year. Thus, the culture of firefighting is one in which there is conscious acceptance of the risk in fires and technical response, yet that same risk is rejected in the name of safety when it comes to ballistic or explosive scenarios.

The same holds true for non-fire EMS providers. In a study of occupational risk for EMS during the period of 1992-1997, there were

67 ground-related and 19 air-ambulance related LODDs.<sup>26</sup> Published statistics demonstrate that there is approximately one emergency medical worker killed every month and scores others injured in transportation-related incidents.<sup>27</sup> It has been shown in multiple studies that lights and siren response to medical emergencies is rarely necessary and does not change patient outcome.<sup>28</sup> Yet, there are few EMS responders who consider or question the risk when going priority on a call. The Fire/EMS paradigm and culture appears to be one that accepts risk, often unnecessarily, as long as that risk is addressed by certain scenarios that fall within the common operational paradigm. In reality, however, risk is risk, and a LODD is tragic regardless of the scenario in which it occurred.

In a study of first responder participation in active shooter events over 33 years, only 4 incidents were documented where responders were killed or injured.<sup>29</sup> All of the injured were first arriving law enforcement personnel. They were wounded either upon first arrival at the scene or while actively pursuing/engaging the shooter. During that same period of time over 3000 firefighters and EMS personnel were killed responding to or operating in standard "risk acceptable operations."<sup>30</sup>

More recently, there have been two significant responder injuries in active shooter incidents. First, Sergeant Kimberly Munley was shot during the 2009 Ft. Hood response.<sup>31</sup> And Lt. Brian Murphy was shot during the 2012 Sikh Temple shooting in Wisconsin.<sup>32</sup> The low number of responder injuries to active shooter events is even more significant in that these law enforcement responders were aggressively pursuing and trying to confront the perpetrator. They *were not* medical/rescue first responders working behind the contact teams in areas that had been cleared but not secured.

The recent tragic event in Webster, New York is considered to be a different scenario and should not be used as an argument of excessive risk. These firefighters were ambushed from a long distance without warning or any indication of threat as they responded to a known house fire<sup>33</sup>. Even the current paradigm of safe staging would not have prevented the loss of life in this scenario. In fact, there are almost no

preventative actions that could account for that form of ambush attack. The concern that one or more additional shooters could be hidden or lying in wait to specifically ambush and attack first responders after the initial contact teams have moved through an area could be conceivable. It is possible that a shooter could hide, wait for the initial police response to move through the area where he is hidden, and then attack the second or third wave of responders. Review of the history of these events and the motives of the individuals involved, shows that such an attack is extremely unlikely, however.

First, out of all the documented active shooter incidents in the United States since 1966, there have been only two cases where there was more than one shooter. The first was the 1998 attack at Westside Middle School in Jonesboro, Arkansas, and the second was the tragedy at Columbine High School.<sup>34</sup> It is difficult for two persons to have the desire to initiate a heinous attack, effectively plan without discovery, and have enough of an understanding and real time operational awareness regarding the response to the event to successfully complete such a delayed ambush. Lying in wait is the exact opposite of what appears to be the objective of such attacks, which is to create havoc and kill as many as possible. Law enforcement research into the common characteristics of the active shooter profile supports that an ambush of the responders behind the contact teams is highly unlikely.<sup>35</sup> Police research demonstrates the unlikelihood of an ambush attack:

[T]hey generally try to avoid police, do not hide or lie in wait for officers and typically fold upon armed confrontation ...They choose unarmed, defenseless innocents for a reason: they have no wish to encounter someone who can hurt them. They are personally risk and pain avoidant. The tracking history of these murderers has proved them to be unlikely to be aggressive with police or other responders. If pressed, they are more likely to kill themselves.<sup>36</sup>

However, the delayed ambush scenario in the middle of an active law enforcement response, although an extremely small risk, is a risk nonetheless. For this reason, Fire/

EMS warm zone medical care and rescue operations should always be coordinated and in conjunction with law enforcement providing security. Rescue personnel can be outfitted and trained in proper ballistic personal protective equipment if jurisdictionally appropriate.

### Who Should Provide On-scene Care?

Tactical medics embedded with SWAT or other specialized law enforcement teams could be proposed as a solution to the gap in Fire/EMS response to active shooter/active killing events. The justification for this might be that these personnel have trained with law enforcement, are outfitted with similar personal protective equipment, are familiar with law enforcement operations, and that they have volunteered to work alongside law enforcement and accept a higher level of risk. Certainly, tactical medics are specially trained to work in high threat environments and are both exceptionally useful and, if immediately available, are one of the appropriate immediate assets to be deployed in active shooter scenarios.

Proponents of tactical medics as the solution could refer to the 2007 Virginia Polytechnic Institute shootings as proof of concept.<sup>37</sup> Although the early deployment of tactical medics certainly saved at least two lives during this incident, the problem is that this argument overlooks the fact that these SWAT teams and their embedded medics were staged and immediately available. If the University Emergency Operations Plan had not been enacted before the onset of the Norris Hall attack, these medics would not have been there and no care would have been rendered inside the building, at least early on in the response.<sup>38</sup> Tactical medics represent a specialized resource in the active shooter Fire/EMS response paradigm similar to the specialized SWAT teams used in the law enforcement response paradigm. It should be noted that law enforcement has moved away from relying on specialized SWAT teams for the immediate response in active shooter situations due to the time constraints of getting resources on scene expeditiously.

Not to undermine their importance or value, but there are multiple issues with relying on tactical medics as the sole indirect threat care rescue/medical asset. In all but a few full-time SWAT teams, tactical medics are part-time and are therefore not always available. Even in full-time teams, because they respond as part of the SWAT package, the on-scene time for tactical medics will be slower than first responding Fire/EMS assets. Tactical medics have a defined mission to provide medical support for the SWAT team officers and the SWAT tactical mission. Thus, they cannot initiate mass wounding care until the primary mission of the SWAT team is completed. And finally tactical medics are an extremely limited resource, with most SWAT teams only having one or at most two medics during any operation. The ability of one or two medics to care for a scene with multiple severely injured casualties spread over a geographical area is extremely limited.

The last argument against Fire/EMS response paradigm shift comes down to history. Despite good evidence and a healthy dose of common sense supporting a shift, the resistant firefighter and/or medic could fall back on an argument based on tradition and existing doctrine. Fire/rescue and EMS training is based largely on apprenticeship-like learning where the student emulates what he/she has been told and shown by his/her superiors; this can lead to propagation of operations and procedures that are not grounded in evidence. Additionally, as a whole, human beings are uncomfortable with change. This natural resistance makes change slow and cumbersome, and requires time, patience and a lot of discussion. Change is never easy, especially when it addresses one of the earliest and most culturally entrenched ideas in operational response. So, how should these holdouts be addressed? The answer is to move forward decisively with solid training, tactics, and equipment to develop an operational paradigm that allows for medical operations in the setting of *mitigated risk*. This will decrease the uphill climb that comes with overcoming operational inertia and, in the end, will help to ease the assimilation of a new paradigm.

## A New Model for Responding to Active Shooter Incidents

The arguments both for and against Fire/EMS paradigm shift are most often related to the points discussed above. The major themes cited again and again involve perceived operational risk, law enforcement responsibility, tactical EMS, medical protocols, and the historical operational perspective. When closely examining these arguments in light of the evidence available on true risk and operational restraints, one can quickly discern the need for change.

A new Fire/EMS response paradigm for active shooters must be implemented. In it, the first-in Fire/EMS responders must work with first responding law enforcement officers to deploy rapidly into areas that have been cleared but not secured, and to initiate treatment and rescue of injured victims. To clarify, as with the law enforcement response, this must be the first arriving Fire/EMS assets on scene, not special operations or tactical medical teams. The law enforcement patrol officers must provide security for the Fire/EMS personnel during operations. The latter must have appropriate medical supplies and equipment and must be trained in some basic law enforcement movement/tactics. These Fire/EMS responders must base their treatments on the medical principles of civilian *Tactical Emergency Casualty Care*, not military *Tactical Combat Casualty Care*, to meet the standard of care for application of medicine in civilian high threat scenarios.

Indirect threat care and high threat medicine are outside the typical EMS protocol, but it would not require radically new standards of care or a prohibitive amount of new training. Although care provided to the wounded in areas of mitigated threat requires a different approach than traditional EMS, this does not represent a significant and expensive training mandate. Developed by a consensus group of operational medical experts using military battlefield medical guidelines as a foundation, the guidelines of *Tactical Emergency Casualty Care* (TECC) represent simple evidenced-based best practice medical guidelines for care

provided by any caregiver at or near the point of wounding during high-risk operations.<sup>39</sup> It is *threat-based care* that defines the relationship between the provider and the threat, and defines the minimum of what is 'needed' medically for life saving measures in lieu of the standard EMS approach that emphasizes what is 'nice' to do.

Developmentally, TECC is the civilian appropriate, civilian guided translation of the successful military *Tactical Combat Casualty Care* (TCCC) guidelines.<sup>40</sup> TCCC was written for the military medical personnel treating a military population in a military setting. Although there is a robust industry built around teaching the military TCCC concepts to civilian responders in 'cookie cutter' courses, the students finishing these courses ultimately have to alter what they learned, or depending on their scope of practice, ignore certain learning objectives to be able to operationalize. The basic issue with *carte blanche* application of military dogma is that the situational aspects of civilian operations are different than those of military operations. TECC was written by civilians for civilian use, and accounts for the aspects of the civilian setting and scope that do not exist in the military. These different aspects include scope of practice, liability, special populations (geriatrics and pediatrics), and baseline health of the population. Since TECC is a set of guidelines and not protocols, it is incumbent upon the local EMS system to evaluate the extent to which TECC can supplement or enhance local EMS protocols. In instances where medical authority and oversight currently conflict with TECC, these areas should be evaluated by the authority having jurisdiction (AHJ) with significant physician oversight in the process.

## FIRE AS A WEAPON

Fire as a weapon refers to the use of fire by criminals or terrorists to kill, maim, and/or evoke fear. Fire is an easy, inexpensive weapon to deploy effectively. It is easy to purchase flammable products without raising suspicion. Although not as potent as explosive materials, modest amounts of flammables are easy to conceal in common items such as bottles or

household cleaning containers. Compared with bomb-making, many incendiary devices require very little technical expertise to assemble. Most importantly, even a small fire has the potential to produce results that are deadly, visibly impressive, and newsworthy. International terrorists and violent extremists routinely advocate the use of fire in their propaganda.<sup>41</sup>

The use of fire as a weapon is as old as fire itself. In recent years, fire has become increasingly common as a means of causing death and destruction.<sup>42</sup> These incidents have been challenging as illustrated in the 2008 Mumbai attack, where hundreds of people were trapped above an intentionally set fire in a massive hotel.<sup>43</sup> Another incident of note would be the 2003 double subway train fire, which began as a suicide attempt and killed 198 in Daegu, South Korea.<sup>44</sup> Domestically we have seen smaller versions of these events such as in 2012 when an armed hostage taker in Los Angeles barricaded himself inside a residence and then set fire to it, endangering nearby occupancies.<sup>45</sup> Frequently, fire is also a byproduct of bombings and explosions. For example, during the 2004 hostage taking at the Beslan Middle School in Russia, the explosions that preceded the rescue attempt caused a fire that resulted in many deaths.<sup>46</sup>

Since the 2008 Mumbai attacks, the use of fire as a weapon may be experiencing a resurgence. Recent terrorist pronouncements, including articles in Al-Qaeda in the Arabian Peninsula's *Inspire* magazine, have encouraged 'pyro-terrorism.'<sup>47</sup> In addition, FDNY's Watchline report stated that fire is a ubiquitous threat in demonstrations against the United States. The report states that "[s]ince the attacks on U.S. diplomatic missions (Benghazi, Libya) on the anniversary of 9/11, one commonality among demonstrations, which have spread to more than twenty Muslim majority countries from Morocco to Indonesia, is the use of fire to either express the protesters' anger or to garner media attention."<sup>48</sup>

Taken alone, each of these incidents represents a possible scenario that a fire department should be prepared to mitigate. Taken together, these incidents form a pattern that justifies greater focus and preparedness by

the emergency response community. Fire as a weapon has a long, evolving history of use by terrorists and extremists and may be finding an increasingly prevalent role in terrorists' tactics, techniques, and planning. The threat is immediate and leaves no justification for not being prepared. However, the fire service has been slow to respond to the evolving threat of fire as a weapon.

## Lessons Not Learned

Perhaps the most significant missed opportunity for the US fire service to learn from the use of fire as a weapon stems from the Columbine High School attack of April 20, 1999. The Columbine Commission Report found that

The Columbine High School tragedy was the work of two disgruntled seniors at the school, Dylan Klebold and Eric Harris, who determined to kill as many teachers and fellow students as possible, first, by planting and detonating two 20-pound propane bombs in the cafeteria and then by shooting survivors fleeing the inferno they hoped to create."<sup>49</sup>

Although the perpetrators ultimately failed in their attempts to detonate the large propane bombs, "they managed to detonate smaller bombs, one of which was attached to a container of flammable liquid. The resulting fire bomb activated the cafeteria sprinkler system, and soon thereafter the sprinkler and fire alarm system were activated throughout the school building."<sup>50</sup> In all the report indicates that 99 explosive devices were found:

[They were]of various sizes and magnitudes in preparation for their attack...Seventy-six of the devices were located in and around the school, thirteen were discovered in the killers' cars in the parking lot and eight more unexploded bombs were found in their homes. Two diversionary bombs (backpacks loaded with pipe bombs, aerosol canisters and propane tanks) had been partially detonated in a field about three miles southwest of the high school.<sup>51</sup>

If the Columbine assailants had successfully ignited their incendiary devices, then the

attack may have played out very differently. An argument can be made that had fire been more of a factor in the incident, the response to the use of fire as a weapon may have also resulted in a paradigm shift for the fire service. Law enforcement received the majority of the criticism for taking so long to search and evacuate the school. However, had the assailants' incendiary devices operated as intended, responder operations would have been significantly delayed. If law enforcement officers were waiting for fire fighters to extinguish the fire, and fire fighters were waiting for law enforcement to secure the scene, then the enduring image of Columbine may have been fire fighters and law enforcement standing by as the school – and those trapped inside – burned. The United States Fire Administration report on Columbine highlighted the need for an integrated response capability that could address the unique demands of the Columbine attack and observed that such incidents, “demand nontraditional responses and tactics.”<sup>52</sup>

Unfortunately, it appears that the fire service has failed to learn from the potential consequences of Columbine and Mumbai. Many fire departments continue to operate with a ‘standby’ policy for active shooter and fire-as-a-weapon incidents. Unfortunately, within the fire service, potential consequences rarely motivate change. When there is significant loss of life, the fire service is more likely to prioritize the issue or problem.

The major fire protection codes, laws, and regulations are a prime example. After incidents where there has been a significant loss of life, major changes have been enacted. For example, the 1942 Coconut Grove Nightclub fire killed 492 patrons and resulted in changes to exit door and capacity regulations, as well as laws banning the utilization of flammable decorations.<sup>53</sup> The 1958 Our Lady of Angels school fire in Chicago killed 92 school children and three teachers, and resulted in sweeping changes in school safety regulations.<sup>54</sup> The Station Night Club fire in 2003 killed 100 people and resulted in the NFPA enacting tough new code provisions for fire sprinklers and crowd management in “nightclub-type venues.”<sup>55</sup>

Change is slow to occur in other areas of the fire service as well. Whether it relates to seat belts, heart disease, or wearing self-contained breathing apparatus (SCBA), the fire service is rarely proactive. The reasons for this reactive mentality are varied and complex and as long as it remains a characteristic of the fire services, lives will continue to be lost.

## WHOSE JOB IS IT?

Whenever weapons, bombs or explosives are involved in an emergency incident, the fire service typically plays a supporting role in the response to law enforcement. Generally, the frontline fire fighter doesn't have the knowledge, skills, abilities, training or equipment to respond effectively and mitigate these types of incidents. Likewise, law enforcement doesn't have the training and tools to handle advanced life support medical emergencies or structure fires. Every day these typical threats are managed by each respective discipline; however, when the threat requires both disciplines to mitigate the circumstances through tactical interventions, what do we do?

Traditionally police and fire departments have put policies in place that require law enforcement officers and/or fire fighters to “standby” if the incident falls under the purview of the other. Alternatively we witness our officers and fire fighters perform outside their scope of practice and comfort zone and ultimately give them awards or honor their supreme sacrifice. For active shooter and fire-as-a-weapon events, standby policies may prove to do more harm than good as noted by Paul Atwater.

The lessons of Columbine – and now 26/11 Mumbai – reveal that the “standby” policy prevents fire fighters from taking calculated risks to save lives or mitigate life threatening hazards during a paramilitary style attack. Unless the fire service finds a way to move beyond the “standby” policy – and into the “warm zone” of potential violence – then fire fighters will remain unprepared for the next paramilitary style attack against the U.S. homeland.<sup>56</sup>

A standby policy may prevent injuries and deaths to firefighters, but added responders safety comes at the expense of response capability. Fire fighters on standby can't mitigate hazards or save lives. If this is an acceptable level of fire department service, then that message should be communicated not only to the citizens, but to other responding agencies and departments, so that they can plan accordingly.

The London Fire Brigade (LFB) is a modern example of successfully integrated efforts between fire and police departments. After the July 7th, 2005 subway attacks (7/7) the LFB changed their tactics to a more aggressive operating posture in high risk areas based on real-time risk/benefit assessment by command.<sup>57</sup> The official coroner's report released on the 7/7 incident vindicated the LFB; however public perception of the response system that kept responders from early rescue operations during this incident forced a change in tactics.<sup>58</sup> As such, in the years leading up to the 2012 London Olympic Games, LFB researched international best practices and worked with operational partners to develop and implement a new approach to high-threat scenarios including "specific incident plans that take into account the threats and hazards outlined in the Olympic Safety and Security Strategic Risk Assessment."<sup>59</sup>

The fire service must also address the inconvenient truth that many of our fire fighters will act when innocent lives are in the balance regardless if there are "standby" policies or not. Many fire fighters and police officers are willing to put themselves in harm's way despite the risks. They see such action as just doing their job as Frank McElroy argues.

Fire fighters also have a history of performing extremely dangerous activities beyond the scope of their training and equipment when such actions were the only way to save a life... it is reasonable to assume that fire fighters will continue to place themselves in great danger to rescue those who would otherwise die, whether the dangers involved are from a fire or hostile gunmen.<sup>60</sup>

A seminal event exemplifying these phenomena is the Freddie's Fashion Mart fire in

Harlem NY in 1995.<sup>61</sup> If history is said to repeat itself and we are serious about learning from our mistakes and/or past, serious introspection should be given to this incident. If we have first responders that are willing to operate in these atypical events, why not provide them with the appropriate education, training, and equipment to increase their chances of survival when they do act?

### **Expectations of the nation**

The general public expects the vast majority of emergencies to be handled effectively and managed by emergency response organizations. During a terrorist attack, public expectation for effective response will be even higher. Some of the increased expectation is related to the amount of time and public monetary expenditure that has been dedicated to post-9/11 emergency response. Undeniably, since 9/11 billions have been given to police and fire departments throughout the United States. As Amanda Ripley notes, "All across the nation we have snapped plates of armor onto our professional lifesavers. In return, we have very high expectations for those brave men and women."<sup>62</sup> Fire and law enforcement agencies throughout the United States have collectively been given huge sums of money to prepare for terrorist incidents; the public expects us to respond effectively to these events. Increased public expectation will also be a natural psychological reaction to an attack. As Paul Atwater argues, "In a moment of great national trauma playing out on television screens around the world," inaction would not be consistent with the expectations – or the needs - of the nation.<sup>63</sup>

Following the attacks of September 11, 2001, the focus was on chemical, biological, radiological and nuclear (CBRN); however, the 9/11 attacks utilized none of these agents. Rather, the terrorists utilized fire as a weapon in the most extreme way imaginable. Yet, over a decade later, the fire service has not been more attentive to this threat. Many fire departments maintain standby policies for active shooter and fire-as-a-weapon incidents, despite awareness that these policies may be inconsistent with

public expectations. Because we have not fully informed the public that we will not respond, we may have left our communities under the incorrect assumption that we will.

Finally, and perhaps most importantly, it is our mission to “protect and serve”. Fire and police personnel are strategically positioned throughout the community to respond to emergencies rapidly and effectively. Along these lines community stakeholders have come to expect a certain level of responsiveness and ability to adapt to most policing challenges. Community oriented policing has been advocated and advanced in practice over the last several years. Likewise fire departments are increasingly canvassing their response areas for not only fire and life safety hazards but also to gain additional awareness in the community, build community trust, and to be an advocate for all hazards preparedness and individual resiliency during emergent times. Both the police and fire departments, already rightly extended and interwoven into the community, have much at risk with significant fallout possible if community expectations are not met.

## CONCLUSION

The active shooter and fire as a weapon response requires a mixed playbook to mitigate effectively emergencies that cross single occupational boundaries. The interdependencies of emergency services organizations become more prevalent on high visibility, multi-casualty, poly-incident objective events. However a joint response model should not be confused with role creep and/or advocating for an instance where one individual or team has a dual role. Arguably, due to the nature of the threat and proximity of the threat to the provider, certain skill sets must be transferred across agencies. Tactical emergency casualty care (TECC) and mitigating fire under an active threat should become an accepted innovation for the community. Eventually, when generally accepted across the emergency services sector as a mandatory capability, it will be culturally ingrained as what is expected for the citizenry. Emergency medical services, hazardous

materials and technical rescue became standard services provided within the fire service as did SWAT within law enforcement. TECC provides a framework for high threat medicine which should be adopted for normalization within the entire emergency services sector.

The arguments presented here are intended to exemplify the systemic way of quantifying the relationship of the provider to the threat and victim, and are solely based upon a mitigated risk model that has been inherent to both police and fire response for generations. For those that serve, we risk much to save much, we risk little to save little, and we risk next to nothing to save nothing.<sup>64</sup> Not implementing a mitigated risk model during incidents of active shooter or fire as a threat is antithetical to this professed philosophy.

We should risk much for active threat incidents when much is to be gained by mitigating those risks with effective tactics (inherent to each responding agency), techniques (TECC based response protocols), and procedures (unified commands and integrated joint action plans). This will require real groundwork and cultural change prior to incident initiation.

The scope and breadth of these intricate and interrelated moving parts require adaptive change, the most complex type of change possible to realize. Such change requires leadership on a monumental scale that affects the “hearts and minds” of providers and decision makers alike across multiple disciplines and stakeholders. Many previous disciplines now readily accepted within the fire service were initially rejected as not being at the core of the fire service mission. Today that sentiment is significantly different. Compelling analysis, best practices, and data have been presented to help mold what we think is an effective future framework to a complex multi-faceted issue that today’s homeland security leader must effectively address to save lives and property.

## ABOUT THE AUTHORS

**Michael Marino** is currently the Battalion Chief of Special Operations for the Prince George's County (MD) Fire/EMS Department. Chief Marino's professional achievements include building significant interagency response capacity for high consequence atypical events. He is the current Chair of the Metropolitan Washington Council of Governments (MWCOG) Law Enforcement and Emergency Medical Services integration committee which in 2011 developed a model framework for interagency high threat response integration within the National Capital Region. Previously, he was a Department of Homeland Security Fellow, National Medical Response Team Task Force Leader and has held faculty appointments at George Washington University facilitating learning in both civilian special operations and high threat medical response. He is a graduate of Harvard's National Preparedness Leadership Initiative (NPLI), currently completing the Executive Fire Officer Program at the National Fire Academy, and his Master's degree concentrated on mitigating homeland security threats. Michael is a voting guidelines member on the Committee for Tactical Emergency Casualty Care (C-TECC), InterAgency Board (IAB) special projects lead, and Maryland certified police officer who may be reached at [mjmarino@co.pg.md.us](mailto:mjmarino@co.pg.md.us).

**John Delaney** has been in the fire service for over twenty-four years; the last 19 years as a member of the Arlington County Fire Department (ACFD), Arlington, Virginia where currently he is the station commander for the technical rescue team. Additionally, he is the program manager for Arlington County Fire Department's High Threat Response Program which focuses on building operational capabilities that will be required for atypical threats to include: active shooter, explosive and fire as a weapon events. The program focuses on the development of multiagency, integrated police and fire response. Previously he was the team leader for the National Medical Response

Team –National Capital Region (NMRT-NCR). The NMRT-NCR was a federally funded weapon of mass destruction response team which comprised of over 150 fire fighters, paramedics, hazardous material specialists, law enforcement officers, doctors, and nurses from within the Washington metropolitan region. His education and training in weapons of mass destruction, hazardous materials, and technical rescue response has allowed for contribution on numerous local, regional, and national initiatives and committees focusing on a variety of first responder and homeland security matters. Currently, he serves as Chair of the InterAgency Board (IAB). He is a graduate of James Madison University and in 2008 received his Master's Degree in Homeland Security from the Naval Postgraduate School. Captain Delaney resides in Ashburn, Virginia with his wife and three children. John Delaney can be reached at [Jdelan@arlingtonva.us](mailto:Jdelan@arlingtonva.us).

**Paul A. Atwater** is a battalion chief for the Seattle Fire Department. He recently completed his master's degree in Homeland Security and Defense Studies at the Naval Postgraduate School and wrote his thesis on Force Protection for firefighters in the warm zone of active-shooter incidents. Paul Atwater can be reached at [Paul.Atwater@seattle.gov](mailto:Paul.Atwater@seattle.gov).

**Dr. Reed Smith** is currently the Operational Medical Director for the Arlington County Fire Department, an Associate Professor of Emergency Medicine at the George Washington University School of Medicine, and an attending physician at the Virginia Hospital Center in Arlington, VA. In his current position as OMD for Arlington County, he oversees all medical operations, provider education, QA and medical protocols, and has developed new and innovative programs including unique operational EMS sub-specialty teams and an innovative pre-hospital response to Active Shooter and explosive scenarios. Most recently, he co-founded and now co-chairs the non-profit Committee for Tactical Emergency Casualty Care to facilitate medical knowledge

*transfer from combat to civilian use. Dr. Smith frequently presents at national and international medical conferences and delivers training to many groups ranging from tactical to operational to hospital-based. Reed is a former EMS provider and Navy Corpsman and has strong interests in Operational & Tactical Medicine. Dr. Reed Smith can be reached at [ereed.smith@gmail.com](mailto:ereed.smith@gmail.com).*

## **DISCLAIMER**

The thesis, opinions, and views expressed in this article are those of the authors and do not necessarily reflect the official position of any government entity or agency represented.

## NOTES

1. F.D. Pratt et al., "PreHospital 911 Emergency Medical Response: The Role of the US Fire Service in Delivery and Coordination," International Association of Fire Fighters, (2007) 5, <http://www.iaff.org/tech/PDF/FB%20EMS%20Whitepaper%20FINAL%20July%205%202007%20.pdf>.
2. Federal Emergency Management Agency (n.d), "Strategies for Marketing Your Fire Department Today and Beyond," 6-7, United States Fire Administration.
3. Federal Emergency Management Agency, "Technical Rescue Program Development Manual," August 1995, [www.usfa.fema.gov/downloads/pdf/publications/fa-159.pdf](http://www.usfa.fema.gov/downloads/pdf/publications/fa-159.pdf).
4. For this article we are assuming that the emergency medical service (EMS) is not a third party service but rather a function of the fire department. As such, proposed changes related to medical operations may be the responsibility of emergency medical services and/or fire departments.
5. Previous incidents include attacks in Mumbai India (2008), Beslan, Russia (2004), Freddie's Berlin, Germany (2011), Freddy's Fashion Mart Fire, NY (1995), Bath Township, Michigan (1927).
6. Department of Homeland Security Note, "Terrorist Interest in Using Fire as a Weapon," May 2012.
7. New York City Police Department, "Active Shooter: Recommendations and Analysis for Risk Mitigation," (2012 Edition), 9 <http://www.nypdshield.org/public/SiteFiles/documents/Activeshooter.pdf>.
8. Douglas Weeks, "Strategic Changes for the Fire Service in the Post – 9/11 Era," (master's thesis, Naval Postgraduate School), 2007, 2-3.
9. Columbine Review Commission, *The Report of Governor Bill Owens' Columbine Review Commission*, (May 2001), 7.
10. Ibid., page x
11. R.R. Rielage, "In the Line of Fire," *Fire Chief* 55, (2009) 12, 30.
12. J. Simmons, Rapid Deployment as a Response to an Active Shooter Incident, *Scribd.com*, (2003), [www.scribd.com/doc/16693309/Rapid-Deployment-asa-Response-to-an-Active-Shooter-Incident](http://www.scribd.com/doc/16693309/Rapid-Deployment-asa-Response-to-an-Active-Shooter-Incident).
13. Force Science, Newsletter no.97, "Ohio Trainer Makes the Case for Single-Officer Entry against Active Killers," <http://www.forcescience.org/fsnews/97.html>.
14. [Thurston Memorial Dedication on May 21.](#) *The Register-Guard*, (2003).
15. Jessica Hopper, Kevin Dolak, and Lauren Sher, "Heroes of Tucson Shooting: 'Something Had to Be Done,'" ABC News, January 10, 2011.
16. J.P. Blair et al., *Active Shooter Events and Response*, CRC Press, (2013), 1-3.
17. Thomas C. Hayes, "[Gunman Kills 22 and Himself in Texas Cafeteria.](#)" *The New York Times*, October, 17, 1991.
18. J.D. Lightfoot, "Rethinking Active Shooter Response," (February 2013), Published on-line at [www.Policemag.com](http://www.Policemag.com).
19. Blair et al., *Active Shooter Events and Response*, 13-21.
20. Columbine Review Commission, *The Report of Governor Bill Owens' Columbine Review Commission*, May 2001.
21. Ibid.
22. Wound Data and Munitions Effectiveness Team, *The WDMET Study* [1970 original data are in the possession of the Uniformed Services University of the Health Sciences, Bethesda, MD].
23. Ibid.
24. Personal communications between Dr. E. Reed Smith and the Dallas Police Department, June 2013.

25. United States Fire Administration, Firefighter Fatalities Statistics and Reports 2011, <http://apps.usfa.fema.gov>.
26. B.J Maguire et al., "Occupational Fatalities in Emergency Medical Services: A Hidden Crisis," *Annals of Emergency Medicine* 40, no.6, (Dec 2002), 625-32.
27. A. Ray, and D. Kubar, "Comparison of Crashes Involving Ambulances with Those of Similar Sized Vehicles," *PreHospital Emergency Care* 9 (2005), 412-415.
28. M.A Merlin et al., "Use of a Limited Lights and Siren Protocol in the Prehospital Setting vs Standard Usage," *The American Journal of Emergency Medicine* 30, no.4, (2012), 519-525.
29. Illinois State Police Academy, "Rapid Deployment as a Response to an Active Shooter Incident," (2003), <http://www.scribd.com/doc/16693309/Rapid-Deployment-as-a-Response-to-an-Active-Shooter-Incident>.
30. United States Fire Administration, Firefighter Fatalities Statistics and Reports (2011), <http://apps.usfa.fema.gov>.
31. Frank K. Butler, MD & Richard Carmona, MD, "Tactical Combat Casualty Care: From the Battlefields of Afghanistan and Iraq to the Streets of America," *The Tactical Edge*, (Winter 2012), 86-91, <http://www.ntoa.org/massemail/CarmonaW12.pdf>; John B. Alexander, *Convergence: Special Operations Forces and Civilian Law Enforcement*, Joint Special Operations University, 2010.
32. S.Yaccino, M. Schwirtz, & M.Santora, "Gunman Kills 6 at a Sikh Temple Near Milwaukee," *New York Times*, August 6, 2012, <http://www.nytimes.com/2012/08/06/us/shooting-reported-at-temple-in-wisconsin.html>.
33. A. Duke, "Brother, Hang Tight,' Wounded New York Firefighter Told as 2 Colleagues Lay Dead," *CNN Report*, December 8, 2012, [www.CNN.com](http://www.CNN.com).
34. New Jersey Regional Operations Intelligence Center, "Mass Shootings Analysis – Commonalities and Trends," FOUO Situational Awareness Brief, November 28, 2012.
35. New York City Police Department, "Active Shooter: Recommendations and Analysis for Risk Mitigation," (2012 Edition), <http://www.nypdshield.org/public/SiteFiles/documents/Activeshooter.pdf>.
36. Force Science, Newsletter no.97, "Ohio Trainer Makes the Case for Single-Officer Entry against Active Killers," <http://www.forcescience.org/fsnews/97.html>.
37. Blair et al., *Active Shooter events and Response*, (Boca Raton, FL: CRC Press, 2013), 23-28.
38. Mass Shootings at Virginia Tech: Addendum to the Report of the Review Panel, (November, 2009), [http://www.governor.virginia.gov/tempContent/techPanelReport-docs/VT\\_Addendum\\_12-2-2009.pdf](http://www.governor.virginia.gov/tempContent/techPanelReport-docs/VT_Addendum_12-2-2009.pdf).
39. D.W. Callaway et al., "Tactical Emergency Casualty Care (TECC): Guidelines for the Provision of Prehospital Trauma Care in High Threat Environments," *Journal of Special Operations Medicine* 1, no.3, (2011), 1-20.
40. See the website for the Committee for Tactical Emergency Casualty Care located at [www.c-tecc.org](http://www.c-tecc.org).
41. Department of Homeland Security Note, "Terrorist Interest in Using Fire as a Weapon," May 2012.
42. Sean Newman, "Braving the Swarm: Lowering Anticipated Group Bias in Integrated Fire/Police Units Facing Paramilitary Terrorism," (master's thesis, Naval Postgraduate School), 2011.
43. Angel Rabasa et al., "The Lessons of Mumbai," RAND Corporation, January 9, 2009.
44. National Emergency Management Agency, "Fire in Daegu Subway," Daegu, South Korea, <http://www.nytimes.com/2003/02/20/world/final-calls-add-to-anguish-over-korean-subway-fire.html>.
45. Hollywood Shooting and Fire, South Division, Post Fire Critique Notes, February 2012.
46. Peter Forster, "Beslan: Counter-Terrorism Incident Command: Lessons Learned," *Homeland Security Affairs* II, no.3, (October 2006), <http://www.hsaj.org>.
47. Department of Homeland Security Note, "Terrorist Interest in Using Fire as a Weapon," May 2012.
48. FDNY Watchline, September 20, 2012.

49. Columbine Review Commission, *The Report of Governor Bill Owens' Columbine Review Commission*, May 2001, i.
50. Ibid., iii.
51. Ibid., 23.
52. United States Fire Administration Technical Report Series, "Wanton Violence at Columbine High School," April 1999.
53. D.Beller, & J. Sapochetti, "Searching for Answers to Coconut Grove Fire of 1942," *NFPA Journal* 86, (2000), 84-92.
54. J. Kleinaitis, "Rising from the Ashes: an Historical Analysis of the Our Lady of the Angels School Fire: Emergence of Leadership and Life Safety Codes," (Doctoral dissertation, Loyola University of Chicago), 1999.
55. "The legacy of the Station nightclub fire," (NFPA, June 6, 2007), <http://nfpa.typepad.com/conference/2007/06/the-legacy-of-1.html>.
56. Paul Atwater, "Force Protection for Fire Fighters: Warm Zone Operations at Paramilitary Style Active Shooter Incidents in a Multi-Hazard Environment as a Fire Service Core Competency," (master's thesis, Naval Postgraduate School), March 2012,1.
57. Dr. E. Reed Smith, Personal communication with London Fire Brigade, 2008.
58. Coroner's inquest into the London bombings of 7 July 2005, (May 6, 2011), <http://webarchive.nationalarchives.gov.uk/20120216072438/http://7julyinquests.independent.gov.uk/docs/orders/rule43-report.pdf>.
59. London Fire and Emergency Planning Authority, Summary of the London Fire Brigade Role in the London 2012 Olympic and Paralympic Games, November 22, 2012, 2, <http://moderngov.london-fire.gov.uk/mgconvert2pdf.aspx?id=1327>.
60. Frank McElroy, "Firefighters' Role at School or Workplace Violence Incidents," Applied Research Paper for the National Fire Academy Executive Fire Officer Program, February 2000, 26.
61. Paul Atwater, "Force Protection for Fire Fighters," 25-26.
62. Amanda Ripley, *The Unthinkable: Who Survives When Disaster Strikes and Why*, (New York: Crown, 2009), xii.
63. Paul Atwater, "Force Protection for Fire Fighters," 82.
64. H. Hill, "Risk Management on the Fireground," *Fire Engineering*, (October 2009), <http://www.fireengineering.com/articles/print/volume-162/issue-10/features/risk-management-ono.html>.

Copyright © 2015 by the author(s). Homeland Security Affairs is an academic journal available free of charge to individuals and institutions. Because the purpose of this publication is the widest possible dissemination of knowledge, copies of this journal and the articles contained herein may be printed or downloaded and redistributed for personal, research or educational purposes free of charge and without permission. Any commercial use of Homeland Security Affairs or the articles published herein is expressly prohibited without the written consent of the copyright holder. The copyright of all articles published in Homeland Security Affairs rests with the author(s) of the article. Homeland Security Affairs is the online journal of the Naval Postgraduate School Center for Homeland Defense and Security (CHDS).