

Oxford Handbooks Online

Strategic Responses to the Boston Marathon Bombing

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Online Publication Date: Aug
2015

Subject: Criminology and Criminal Justice, Terrorism and
Security, Violent Crime

DOI: 10.1093/oxfordhb/9780199935383.013.99

[–] Abstract and Keywords

The explosions on April 15, 2013 during the Patriot's Day Marathon in Boston mark the first major terrorist attack in the United States since 9/11 and the first time since 1996 that terrorists targeted a major US sporting event. This chapter reviews events before and after the bombing to explore strategies to reduce risk and harm at sporting events without compromising the ideals of freedom and human capacity inherent to all sports. The chapter first presents the background of the Tsarnaev brothers and the challenges they faced. It then describes what is known of their plans for the day of the Marathon and the pursuit by law enforcement after the attack. It details the tactical and technological advances that helped law enforcement successfully end the crisis and arrest the surviving perpetrator. Finally, it discusses prevention and harm reduction measures that have since been adopted in major sporting events.

Keywords: Boston Marathon Bombing, terrorism, emergency response, risk reduction, emergency coordination

During the crisp afternoon in Boston on April 15, 2013, runners of the 117th annual Patriot's Day Marathon made their way toward the end of the race. As congestion at the finish line was nearly at its densest—four hours, nine minutes, and 43 seconds after the third wave of runners began—two bombs exploded, one right after the other, transforming the scene from one of enthusiastic celebration and joy to devastating images of flying debris, fiery smoke, shards of glass, cries of pain, bloody sidewalks, and severed limbs. The explosions killed three—eight-year-old Martin Richard, 23-year-old Lu Lingzi, and 29-year-old Krystle Campbell—and injured more than 260 others, including Martin Richard's sister, who lost her left leg (Ford and McShane, 2014). People suffered from severe shrapnel wounds, burns, ruptured eardrums, leg injuries, and at least 16 persons lost limbs either during the explosion or a later amputation (Weise, MacDonald, and Weintraub, 2013).

Moments after the explosion, hundreds of emergency workers and bystanders ran toward the blast area to help the injured. A large number of people climbed over or tore down barricades in order to help those in need. Both medical staff and civilian helpers placed tourniquets on survivors and transferred them to medical tents and ambulances (Leonard and Howitt, 2013). Six hospitals in the area treated more than 140 victims, all of whom survived. The success of these efforts was largely due to the already established emergency response plans coordinated by Boston hospitals and emergency workers for mass casualty incidents, allowing them to effectively treat the surge of incoming patients as they coordinated with other emergency responders (FEMA, 2013).

Over the next several days, details of what transpired became apparent as law enforcement reviewed footage from thousands of videos. Surveillance cameras revealed that at 2:38 p.m. (eleven minutes prior to the explosions), brothers Tamerlan, 26, and Dzhokhar Tsarnaev, 19, turned onto Boylston Street and walked toward the finish line of the marathon wearing baseball caps and bulky backpacks. Three minutes later, film showed them standing together for a moment before Tamerlan walked up the street alone. Additional surveillance then showed the younger brother, Dzhokhar, standing with his backpack when the first bomb exploded. As if on cue, he then casually dropped the backpack and walked away; and twelve seconds later the second bomb exploded from where he had been standing (McLaughlin, 2013).

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The devastating explosions that day mark the first time since the 1996 Olympic bombings in Atlanta that terrorists had targeted a sporting event in the United States. More profoundly, this is the first time since the 2001 September 11 attacks that the general public was so violently targeted by extremists. By producing mass casualties at a much-loved sporting event during the post 9/11 era, this attack represents the first time that emergency workers, law enforcement, and civilian Americans have worked together to aid the injured, secure the environment, and capture the terrorists. As will be shown in this chapter, advances in technology and specialized training facilitated the capture of the perpetrators, ending a harrowing week in Boston that, during an earlier time, might have dragged on for several violent weeks.

We begin by presenting the background of the Tsarnaev brothers, including their arrival to the United States and the challenges they faced since then. We then describe what is known of their plans for the day of the Marathon and the pursuit by law enforcement after the attack. We then detail the tactical and technological advances that helped law enforcement successfully end the crisis and arrest the surviving perpetrator. In the remainder of the chapter we discuss prevention measures that have since been adopted in major sporting events to reduce harm from possible terrorist attacks.

The Perpetrators

The deliberateness behind the Tsarnaev brothers' decision to perpetrate an attack on the Boston Marathon becomes evident once their family history is reviewed. Their unique socio-historical context reveals much about their mindset and motivations for engaging in terrorism, and the details of their preparations could provide insight into how to avert future attacks. This section documents their backstory and the preparations for their attack. It also provides some insight into how their personal development influenced their decisions, explaining how two relatively successful brothers decided to attack an iconic sporting event.

Tsarnaev Backstory

Although potentially connected to jihadist revolutionaries prior to the bombing, those close to the Tsarnaev brothers have indicated that their decision to bomb the Boston Marathon was probably shaped by both personal experiences and the family's turbulent history (Jacobs, Filipov, and Wen, 2013). Each brother was born in a different country, Tamerlan in Kalmyk (USSR) and Dzhokhar seven years later in Kyrgyzstan (Wood, 2013), to a Chechen father, Anzor, and an Avar mother, Zubeidat (Semenov, Nikolaev, and Veijalainen, 2013). Two sisters, Bella and Ailina, were also born five and three years before Dzhokhar, respectively (Raasch and Alcindor, 2013). Over the course of their early years the Tsarnaev family lived in Kyrgyzstan, Chechnya, and Dagestan (Wood, 2013). The Tsarnaev parents report that the family was persecuted during this period as the father, Anzor, was tortured and the family's German Shepherd was beheaded (Jacobs, Filipov, and Wen, 2013). The turbulence of their childhoods is evident through their mobility; indeed, the two brothers may have also lived in Kazakhstan and Turkey (Wood, 2013). By the time the Tsarnaev family considered moving to the United States, the brothers were either triple or quadruple refugees (Wood, 2013).

In 2002, Dzhokhar Tsarnaev and his parents migrated to the United States from Kyrgyzstan, followed by Tamerlan and his two sisters the following year (US Intelligence Community, 2014). Over the ensuing years, all family members were granted Lawful Permanent Residency status (LPR) within the US (US Intelligence Community 2014). Although the Tsarnaev parents gained employment as a car mechanic and as a cosmetologist (Jacobs, Filipov, and Wen, 2013), they were also accused of larceny and the mother was later arrested for shoplifting (Saletan, 2013). Despite the difficulties of their parents, the Tsarnaev brothers enjoyed some early success in their lives in Boston.

Tamerlan

As a teenager, Tamerlan showed great potential as a boxer, and his family believed he was headed for the Olympics (Jacobs, Filipov, and Wen 2013). Despite winning the New England Golden Gloves heavyweight championship two years in a row, a rule change preventing noncitizens from participating in the golden gloves championship ended his boxing career (Jacobs, Filipov, and Wen, 2013). Yet Tamerlan's violence also extended beyond the ring, as he allegedly punched his sister Bella's boyfriend in 2007 and "roughed up" his sister Ailina's husband in 2008 (Murphy, Tanfani, and Loiko, 2013). He was also arrested but never convicted for domestic

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violence against a girlfriend (Jacobs, Filipov, and Wen, 2013).

During this period of turmoil, Tamerlan's mother pressed him to more fully embrace Islam, which prompted him to give up alcohol but not marijuana (Murphy, Tanfani, and Loiko, 2013). He studied religion, philosophy, the history of Chechnya, and Islamist websites (Jacobs, 2013). Tamerlan also began to regularly attend a mosque in Cambridge Massachusetts, where he spent time with Don Larking, who introduced him to *The Sovereign, Newspaper of the Resistance* known for its discussion of conspiracies behind the World Trade Center attacks. However, Larking has stated that Tamerlan had already disapproved of Obama's use of drones and expansive foreign policy (Jacobs, Filipov, and Wen, 2013).

In 2010, Tamerlan married Katherine Russell, an American who converted to Islam (Jacobs, 2013). His political views became more polarized, especially after his parents divorced in 2011 and his father moved to Dagestan (Jacobs, Filipov, and Wen, 2013). Spending more time at home, the unemployed Tamerlan began expressing his anti-US views on the Internet and chastising his friends for drinking alcohol and cohabitating outside of marriage (Jacobs, Filipov, and Wen, 2013). One of these friends, Brendan Mess, was found murdered along with two other of Tamerlan's friends in their apartment in September 2011 (Zalkind, 2014). Soon afterward Tamerlan left for Dagestan, skipping their funerals (Jacobs, Filipov, and Wen, 2013) and was later allegedly implicated in the homicides by Ibrahim Todashev, who was shot by the FBI before being able to sign a confession (Zalkind 2014).

While in Dagestan, Tamerlan became involved with *The Union of the Just*, a nonviolent group led by his cousin that campaigned against human rights violations against Muslims (Barry, 2013). He socialized and studied the Koran with its members but later prayed with Salafi Muslims (Barry, 2013). Tamerlan also made contact with William Plotnikov and possibly Makhmud Nidal, who were both members of an armed insurgency (Filipov and Bender 2013). Although it is unclear whether Tamerlan made contact with the underground in Dagestan after the death of William Plotnikov in a counterterrorist raid in July 2012, he left Dagestan promising that he would one day return (Barry, 2013).

Dzhokhar

When comparing the two brothers after the attack, Tamerlan was portrayed in the media as the "terrorist" and Dzhokhar was portrayed as "the citizen" (Volpp, 2014). Although Dzhokhar, called "Jahar" by his friends, was embraced by his peers and received official recognition for his pursuits (e.g., MVP of his high school wrestling team, scholarship winner, and National Honor Society), he also struggled (Jacobs, Filipov, and Wen, 2013). Dzhokhar smoked and sold marijuana from his dorm room at the University of Massachusetts at Dartmouth, which earned him additional income but also compromised his academic performance, as the university issued many warnings for low grades (Jacobs, Filipov, and Wen, 2013).

Socially, Dzhokhar was a leader and his friends often counted on him to talk the police out of punishing them for drug use and traffic violations (Jacobs, Filipov, and Wen, 2013). While attending college, Dzhokhar's friends also report that he drove recklessly, flaunted his illegal income, and regularly carried a gun (Jacobs, Filipov, and Wen, 2013). Following Tamerlan's lead, Dzhokhar also began to publicly identify with his Chechen heritage on several social networking sites (Jacobs, Filipov, and Wen, 2013). The brothers reconnected during the summer of 2012 when both were living in the Tsarnaev's Cambridge home. When Dzhokhar returned to campus in the fall of 2012, he faced more than \$20,000 in financial debt because of his low grades, thus making it clear that he would be unlikely to graduate (Jacobs, Filipov, and Wen, 2013). He began to spend an increasing amount of time at the Tsarnaev home in Cambridge, where it was likely that Tamerlan had begun to plan the bombing (Jacobs, Filipov, and Wen, 2013).

Plans for Attack

Evidence now indicates that many elements of the Boston Marathon bombing were planned well in advance of that day. According to Dzhokhar, the brothers used Internet research to train themselves on bomb-making (Vorhees, 2013). In fact, they relied on the article from al Qaeda's *Inspire* magazine, "Make a Bomb in the Kitchen of your Mom," to construct an explosive device using a pressure cooker from easily obtained materials such as fireworks, gunpowder, and match heads (Reitman, 2013). Tamerlan then procured the necessary elements. According to records in a New Hampshire store, on February 6, 2013, Tamerlan purchased two reloadable mortar kits for around

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\$200—each containing 24 shells with more than eight pounds of explosive powder (Isikoff, Williams, and McClam, 2013). He later ordered the electronic parts for the explosive devices over the Internet (Lavoie and Hays, 2013). On March 20, 2013, the brothers trained for the event on a firing range where they rented two 9mm handguns and 200 rounds of ammunition (Reitman, 2013).

Despite this planning, it appears that the Tsarnaev brothers spent less time preparing the steps they would take following the Marathon explosions. They presumably intended to perpetrate at least one other major attack, as they prepared five pipe bombs and an additional pressure-cooker bomb that could have been detonated remotely (Botelho and Levs, 2013). However, according to Dzhokhar, the target of the next attack was only decided as they fled Boston in a hijacked Mercedes SUV—New York City’s Time Square (Honan and Hosenball, 2013).

The timing and choice of the target for the initial blasts suggest that they intended to maximize the impact of the explosions, ideas that were lauded in the issue of *Inspire* that was released immediately after the Boston Bombing (Bender, 2013). The Tsarnaev brothers’ attack generated uncertainty within the crowd instead of exploding at the most focal and likely most well-defended section of the race. Rather than being positioned at the finish line and detonating as the lead marathoners crossed it, the devices were planted approximately 200 yards apart in the last 225 yards of the marathon route, where the crowd was at its thickest (FEMA 2013). When the bombs were remotely detonated, approximately 17,000 runners had already finished the race, with about 9,000 more still running (FEMA, 2013). It was strategic decisions such as these that particularly gained the commendation of *Inspire* following the bombing:

The Tsarnaev mujahedin’s choice of Boston as a target for the bombings was very appropriate indeed. Why? Because it is relatively out of the enemy’s attention as a potential target to the mujahedin, unlike New York for example, which is under intensive security surveillance since Sept. 11 ... The bombers also struck at the “substantial heart of Boston center ... whereby many hotels are around. MIT is in the neighborhood, Fenway Park the home ball park of the Boston Red Sox baseball club is not far, also Boston university and Boston college are located near the blasts

(Excerpt from Inspire Magazine in Bender 2013: 3–4).

Previous Tsarnaev Security Threats

Two years prior to the bombings, the Tsarnaev family was identified as a potential threat to US security. Though they were not actively pursued until after the bombing, the Tsarnaev family received varying levels of scrutiny from different international intelligence agencies. In March 2011, the Russian Federal Security Service (FSB) alerted the FBI to the presence of the Tsarnaev family, as Tamerlan and his mother, Zubeidat Tsarnaeva, were adherents to radical Islam (US Intelligence Community, 2014). The FSB also reported that Tamerlan was preparing to join “bandit underground groups” in Dagestan and Chechnya (US Intelligence Community, 2014). An FBI-led Joint Terrorism Task Force in Boston (Boston JTTF) reviewed this intelligence and concluded that the case showed no link to terrorism (US Intelligence Community, 2014).

The FSB also reached out to the CIA with similar intelligence, resulting in Tamerlan Tsarnaev being added to the terrorist watch list (US Intelligence Community, 2014). Despite this designation, three months later, Tamerlan traveled to Russia, as predicted by the previous FSB reports, without prompting any additional investigations (Jacobs, Filipov, and Wen, 2013). Further, Tamerlan’s use of legitimate and traceable credentials to purchase the ingredients of the explosive devices was undetected prior to the attacks (Maremont, Perez, and Barrett, 2013).

Investigation and the Boston Lockdown

Because the Boston Marathon is among the highest-profile events in the United States, the attack left thousands of potential witnesses, many of whom carried digital recording devices, which produced an overwhelming amount of potential evidence to investigators. This modern-day advantage led to two major investigative paradigms: the traditional intelligence gathering from cooperative witnesses and the need for advanced forensic technology. Despite the best efforts of these two approaches, however, breakthroughs were made mainly from cooperative witnesses.

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The first breakthrough came when Jeffrey Bauman, a witness who lost both of his legs below the knee in the explosions, was able to accurately describe Tamerlan Tsarnaev to an FBI sketch artist (Ronayne, 2013; Walsh, 2013). Bauman, who had made eye contact with Tsarnaev in the crowd as he set down his backpack, was also able to pinpoint where investigators should focus their attention in the moments before the blast (Walsh, 2013). Images revealed the suspects as two young men in black and white baseball caps, who seemed to stand out from the crowd (Montgomery, Horwitz, and Fisher 2013). Facial recognition software failed to identify the Tsarnaev brothers, despite both profiles existing in official databases (Montgomery, Horwitz, and Fisher, 2013). It was only when the photos of the suspects were made public that the brothers' aunt confirmed to the FBI that the two in the photographs were Tamerlan and Dzhokhar Tsarnaev (Montgomery, Horwitz, and Fisher, 2013).

The FBI led a team from the local JTTF to search for the suspects. More teams joined the effort, including around 19,000 National Guard troops with armored vehicles and Blackhawk helicopters (Balko, 2013). The first sign of the marathon suspects came four days after the explosion, in connection with the shooting of Police Officer Collier in Watertown, Massachusetts. Although it was unclear at first, the two men in the surveillance footage seen sneaking up behind Officer Collier in his vehicle and shooting him five times were the suspects from the marathon bombing (Leonard, Cole, Howitt, and Heymann, 2014). Shortly afterward, a man who escaped from a carjacked Mercedes SUV reported that his assailants bragged that they just shot a police officer and were probably heading to New York. It was only later that the victim recalled that they also said that they were responsible for the Boston Marathon bombing (Leonard et al., 2014). Because of the limited information, the local Watertown police were looking for the SUV in connection to the carjacking and the officer's murder—not the Boston Marathon bombing. The driver left his cell phone in the vehicle, making the suspects traceable through "pinging" (Arsenault and Murphy, 2013).

The police found the suspects in Watertown, which led to an exchange of gunfire—including explosives thrown by the suspects (Arsenault and Murphy, 2013). By this point law enforcement suspected that the assailants were the perpetrators of the marathon attack (Leonard et al., 2014). One of the suspects, Tamerlan, approached an officer, shooting until his weapon stopped firing. Tamerlan then threw his gun at the officer, and then turned and ran before being shot and tackled. As the police were trying to handcuff him, Tamerlan was run over by Dzhokhar in the SUV as he fled the scene (Leonard et al., 2014). Tamerlan Tsarnaev later died at a Boston hospital due to what doctors described as multiple gunshot wounds and a possible blast injury (Associated Press, 2013). Early the next morning fingerprints confirmed Tamerlan Tsarnaev's identity, leading to a full-scale investigation into the Tsarnaev family (Leonard et al., 2014).



Figure 1 Tweet by Boston Police Department following the capture of Dzhokhar Tsarnaev.

Soon afterward, Dzhokhar abandoned the stolen SUV and consequently the tracking device. With the remaining suspect identified but his location unknown, the governor ordered that a "shelter in place" take effect in Watertown and surrounding communities. Businesses were asked to voluntarily close, and it was suggested that residents stay inside with their doors locked. Public transportation was suspended until further notice (Leonard et al., 2014). Tactical teams were deployed to do house-to-house searches, with little luck. It was only after the governor lifted the shelter in place order that a civilian provided the lead that led to Dzhokhar's capture (Montgomery, Horwitz, and Fisher, 2013). A Watertown resident discovered the suspect curled up inside his boat, after noticing that its cover was flapping loosely and its side was marked with blood (Montgomery, Horwitz, and Fisher, 2013). The police arrived within minutes after the resident's 911 call and exchanged fire with Dzhokhar (Montgomery, Horwitz, and Fisher, 2013). After 25 minutes of negotiation, Dzhokhar surrendered and was taken to the hospital to have his gunshot wounds treated (Montgomery, Horwitz, and Fisher, 2013). The Boston Police Department (2013) announced the capture on Twitter (Figure 1):

Tactical and Technical Advances During the Crisis

We now more closely examine the advances made by law enforcement that helped reduce potential damages in the aftermath of the bombings by quickly clearing the scene, swiftly identifying the perpetrators, and successfully incapacitating the Tsarnaev brothers. These advances are especially poignant because the Boston attack was the first major terrorist event in the United States since the September 11 attacks in 2001, after which law enforcement—especially in major cities—began to incorporate homeland security practices into their operations. We discuss next how preparedness trainings prior to the 2013 Patriots' Day Marathon, leaderless coordination across multiple jurisdictions during the event and its aftermath, cooperation through social media and crowdsourcing of data, and of course luck, all contributed to this success. We then suggest further advances that could help law enforcement take further advantage of the available technologies in order to more quickly bring future terrorist attacks and other crises to an end.

Preparedness Training and Leaderless Coordination

The events of 9/11 altered many aspects of our society, but perhaps the most salient among law enforcement is that many agencies now incorporate into their routine practices preparedness training for mass casualty events. This training requires officers to cooperate with other first responders, leading police to develop predisaster relationships with other nearby law enforcement agencies, emergency workers, physicians, and others who participate in the same regional trainings. This type of emergency coordination has long been established for those who respond to natural disasters; and since the tragedies in New York, Pennsylvania, and Virginia, it has become clear that responses to terrorist attacks could draw upon the same strategies used during and after natural disasters (Waugh and Streib, 2006). In fact, just months after the 9/11 attacks, the National Academy of Sciences hosted a Natural Disasters Roundtable in February 2002 called "How Natural Disaster Research Can Inform Response to Terrorism" (Demuth, 2002). This panel of experts included policymakers, emergency managers, first responders, public health workers, physicians, and researchers, who concluded that for effective disaster management—whether for natural or human-induced disasters—there is a high need for effective organization and communication. While the report provided important information for coordination and technology, it did not specifically mention the role of law enforcement during terrorist attacks. Yet, clearly, human-induced disasters need to involve law enforcement, despite their unfamiliarity with the scholarship on planning for natural and technological disasters (Perry and Lindell, 2003). Further, both 9/11 and the 1995 attack in Oklahoma City demonstrated that response teams for terrorist attacks need the expertise of an emergency management network (Waugh, 2003). Thus, in order to be effective during a terrorist attack, law enforcement needs to work well with other emergency responders. However, this endeavor requires a fundamental shift in operations, as most law enforcement agencies are independent hierarchical organizations, which could possibly debilitate them during emergencies, as operations depend too much on the functionality of one leader. Instead, effective emergency management necessitates redundant communication to avoid depending on any single node (Kapucu, 2006).

This need for coordination is emphasized among the many recommendations presented by the 9/11 Commission, urging local first responders and federal investigatory agencies to better manage efforts and share information (National Commission on Terrorist Attacks Upon the United States, 2004). In order to create a federal response plan, in 2004 the relatively new Department of Homeland Security (DHS) established a National Incident Management System (NIMS) within the Federal Emergency Management Agency (FEMA). NIMS is "a systematic, proactive approach to guide departments and agencies at all levels of government, nongovernmental organizations, and the private sector to work together seamlessly and manage incidents involving all threats and hazards—regardless of cause, size, location, or complexity—in order to reduce loss of life, property and harm to the environment."¹ NIMS has become the basis for preparedness trainings throughout the United States.

Through DHS's Urban Areas Security Initiative, the Boston region formed the Metro-Boston Homeland Security Region (MBHSR) in order to expand regional collaboration and to strengthen its ability to implement the NIMS preparedness plan. MBHSR regularly conducts Urban Shield trainings, which are 24-hour exercises that deploy first responders to various training scenarios.² Two trainings occurred in the two years prior to the Boston Marathon attack, and the third was scheduled for two months after it. Ironically, the scenario planned for the June 2013 Urban Shield training looked very similar to the actual attack in April, as pseudo-terrorists were planning to leave backpacks filled with explosives throughout the region (Cramer, 2013). Through these trainings and other opportunities to drill during public events (e.g., 2004 Democratic National Convention, July 4th Esplanade), regional

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emergency response teams have continued to improve emergency response operations (Marcus, McNulty, Dorn, and Goralnick, 2014).

Thus, by April 15, 2013, the regional law enforcement and emergency workers in the Boston area already had established a working relationship. After the explosions that day, pairs of senior officials from the different security agencies sought one another and self-organized into a multi-agency joint command structure located in a local hotel ballroom (Leonard et al., 2014).³ It was through this type of leaderless coordination that subcommand teams were immediately established to address pressing tactical needs such as evacuating people from the crime scene, searching for additional explosives, clearing the area (duffle bags were everywhere), and collecting security camera videotapes. One team of National Guard personnel, who had been walking the marathon route for a training hike, was deployed to help manage and assist runners who needed to be stopped before the impact zone (Leonard et al., 2014). Central command also focused on broader strategic concerns, such as whether this attack was part of a larger coordinated event and whether another attack was imminent. As an effort to reduce further harm, they identified trauma centers as possible secondary targets and sent tactical teams to provide additional security.

Because Boston Mayor Thomas Menino was in the hospital recovering from surgery, Massachusetts Governor Deval Patrick began the series of joint press conferences with Police Commissioner Edward Davis just two hours after the explosions. The purpose of the first press conference was to present a unified message and to answer questions. As the Mayor and FBI joined the later press conferences, it was acknowledged that the bombing was most likely a terrorist act and that the FBI would lead the investigation through Boston's existing JTTF. They also announced that Boston will be "open for business" but with heightened security. The FBI also requested that members of the public submit their photos and videos of the event to aid investigation. Leaders all agreed to cooperate fully so that information would flow smoothly—reaffirming the principle of leadership coordination. Yet missteps did happen as lower-level investigators hit institutional barriers, reluctantly collaborating only after senior leaders addressed the friction.

The primary challenges for the team were to (1) manage the flow of communication about the event, (2) manage the criminal investigation, and (3) continue daily police operations (Leonard et al., 2014). Sometimes these efforts were at odds, which became apparent after the team uncovered photos of the suspects and were unsure whether to release them to the public. Those who were concerned primarily with public safety advocated releasing the photos in order to avert further attacks and more quickly identify the suspects. However, those in charge of the investigation were concerned that once the suspects saw their images, they would go deeper into hiding, thus hampering the investigation (Leonard et al., 2014). The photos were released at 5:20 p.m. on Thursday, April 18 with a warning that the suspects were armed and dangerous (Marcus et al., 2014).

Later that night, after the murder of Officer Collier, Watertown police exchanged gunfire with the suspects. Until the capture of the final suspect, tension between public safety operations and investigative management persisted. Coordination among law enforcement during the shootout was difficult, as more than 1,000 officers responded to the call, each acting independently to stop the suspects (Marcus et al., 2014). Only when senior commanders arrived did the officers respond congruently. However, confusion once again ensued after the first suspect was shot and the other escaped in the stolen SUV. Distracted by the realization that the suspects were likely to be the marathon bombers, officers treated several vehicles and pedestrians as suspects by drawing their weapons and putting other officers in the line of fire (Leonard et al., 2014). Once senior police officers took charge, they formed a joint command post and organized a larger search and apprehension mission at the Arsenal Mall, establishing a 20-block perimeter around the abandoned SUV. Some officers watched the perimeter while others systematically searched the cordoned-off area starting at dawn. Leaders were able to quickly coordinate these efforts as they drew upon their previous training and established relationships (Leonard et al., 2014).

As tactical teams conducted house-to-house searches, intelligence on Tamerlan Tsarnaev was being collected in the command center—once again operating at two levels. Tactical teams were deployed in Blackhawk helicopters to New Bedford and Dartmouth, Massachusetts to pursue evidence or associates connected to the bombings (Leonard et al., 2014). Cooperation was high, but coordination sometimes suffered, as evidenced by the absence of any systematic plan to relieve personnel, leaving many teams working nonstop for close to 15 hours. Working such long hours is bound to impair judgment. After the second suspect was located in Watertown, a large number of officers deployed to the address, causing a great deal of confusion as some officers moved into other's lines of fire. Contributing to the disorder, officers ignored orders from high-ranking officers from other agencies arguing

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jurisdiction. When the suspect tried to lift the boat cover with a fishing gaff, a rooftop tactical team fired upon him, leading to an outbreak of gunfire from others.

Once again, leadership stepped in to organize the response around the boat. The perimeter was secured, and officers were moved out of one another's lines of fire. The FBI's Hostage Rescue Team (HRT) was deployed and coordinated with the incident commander. Because the suspect might have been armed and wearing a suicide vest, they sent a robot in to remove the tarp and provide a better view for officers in the helicopters that hovered overhead. The HRT then used flash-bangs to stun the suspect, thus leading to his surrender.

Although the operations that week were imperfect, had the leadership across regional agencies not previously trained together, events could have turned out very badly. Other countries, like Israel, are attacked so frequently that they are able to respond to an emergency, evaluate the response, and then update their procedures and practices (Dugan, Liu, Chenoweth, and Fisher, 2014). Because the United States experiences relatively few attacks, its jurisdictions rely on staged false crises to drill units on how to best respond to mass casualty events. Although it is good news that the United States experiences so few terrorist emergencies, without direct experiences US law enforcement is less likely than their Israeli counterparts to strategically improvise when crises take surprising turns.

According to Perry and Lindell (2003), emergency drills should be complex enough to identify problems in the current emergency response plan so that adjustments can be made and participants can expand their response repertoire, thus allowing future improvisation to be more calibrated and reducing disorder. Marcus et al. (2014) argues that the leadership that week was successful because they operated under "swarm intelligence," a phenomenon where much is achieved without any one person in charge. Indeed the requirements of swarm intelligence seemed to have been met that week as the mission was unified (i.e., save lives), most operated from a place of generosity (i.e., working hard and sharing information), and the emergency response team had already established a trusting relationship.

Social Media and Crowd Sourcing

Certainly the FBI recognized the value in eliciting the public's help to identify the perpetrators that week, and formal crowdsourcing has been common practice in the United States for more than a century. This is evidenced by old "WANTED" posters and in more unruly activities such as vigilante groups engaged in manhunts, sometimes leading to spontaneous public executions (Brown, 1975). More recently, crowdsourcing strategies have exploited advances in communication technology by producing television shows like *Crime Stoppers* and *America's Most Wanted* and establishing tip lines for callers to report leads on specific cases. As the Internet and social media sites have become integrated into our daily lives, law enforcement increasingly turns to social media to supplement investigations. The latest Social Media Survey (2013) conducted by the *International Association of Chiefs of Police* found that 96% of agencies use social media in some capacity, and 86% use it for criminal investigations (IACP, 2014). Indeed, 80% claim to have used social media to help solve crimes in their jurisdiction. Marx (2013) demonstrates this point well by comparing two investigations by police of hockey riots in Vancouver. In 1994, the police used kiosks throughout the city to display news clips of the riots, and then asked citizens to review them and identify those they recognized. Seventeen years later the tactic no longer required citizen helpers to leave their homes, as online users were asked to post photos on Facebook pages called "Vancouver Riot Pics: Post Your Photos" and "Naming and Shaming" (Marx, 2013).

Technological advances also helped law enforcement identify the Boston Marathon perpetrators after the FBI requested that bystanders share their images and video recordings of the event, which resulted in thousands of photographs and short video clips being submitted directly to the authorities (Tapia, LaLone, and Kim, 2014). Numerous online groups (including Reddit and Anonymous) took it upon themselves to become repositories of those data to share with the FBI and also for users to conduct their own investigations into the identity of the perpetrators (Tapia et al., 2014). After one of the injured victims, Jeffrey Bauman, helped the FBI narrow its search by describing a man who dropped a bag shortly before it exploded, the FBI was able to isolate images of the suspects and circulate them to local law enforcement agencies. While the public was yet to see these images, media described them as two men wearing hats and carrying backpacks, triggering an unofficial release of misidentified "Bag Men" on the front page of *The New York Post*, an accusation it later retracted (Estes and Abad-Santos, 2013). Later that day, the FBI released the photos and video clips on its official website and asked the

media and public to help them identify and locate both men (McCullagh, 2013). To avoid more missteps, Reddit deleted photos of all other persons from their website so that crowdsourcing would only be used to identify the suspects put forth by the FBI (McCullagh, 2013). Unfortunately, their vigilantism led to the misidentification of other uninvolved persons, thereby triggering a damaging media blitz (Bidgood, 2013). Despite these blunders, by setting up a tip site to allow for continued crowdsourcing, the identities of the suspects as Tamerlan and Dzhokhar Tsarnaev may have been facilitated, allowing law enforcement to actively pursue the suspects within days of the attack.

However, the unfolding of events that week may raise concern that crowdsourcing might become more harmful than helpful. The public acted in frenzy, and media quickly jumped on unverified information, leading to the slandering of innocent persons—including a Brown student who had committed suicide before the attacks. Yet by eliciting the public's help, thousands of images and video clips from cell phones that captured pervasive perspectives were entered into the investigation, and hundreds of thousands of people became potential sources to accelerate investigative efforts. Regardless of whether crowdsourcing produces more harm than good, we are beyond the days where it is a choice that can be avoided. Crowdsourcing is here to stay, as the public no longer requires an invitation to swamp social media sites with images of unfolding crises. By accepting this inevitable flow of imagery and amateur sleuthing, law enforcement can develop protocols to harness the public to better facilitate investigations and reduce harm. Indeed, according to the latest results from the International Association of Chiefs of Police, nearly 70% of surveyed agencies have established a social media policy and another 14% are in the process of developing one (IACP, 2014).

Improvements That Could Be Made

The relatively short period of time it took law enforcement to identify the perpetrators and track them down certainly demonstrates the improved communication and coordination between different law enforcement agencies and the community. However, authorities could develop existing advances in technology to assist investigations as terrorist events rapidly unfold. Cassa, Chunara, Mandl, and Brownstein (2013) show how Twitter postings provided breaking updates faster than the major news stations; and with the geographical identifiers, the postings could have been used to localize and characterize unfolding events in ways that can guide emergency responders. Yet current technology falls short of usefully streamlining the investigation. Ware (2013) argues that it is difficult for police to review the anticipated influx of thousands of video and images from witnesses and security cameras within the vicinity of an attack. Yet the film industry currently has the technology to orient images and film in space and time in order to create a mosaic of an unfolding event from these files. Ware (2013) also suggests that authorities configure an interface that integrates data using complex event processing that would reveal critical information during rapidly evolving situations (like terrorist attacks); adopting link analysis programs that would allow first responders to quickly find available information on key suspects in an event; and developing large-scale GIS capabilities for law enforcement to be able to correlate important locations with social media reports.

Of course, the ideal strategy would be to prevent any more attacks against future sporting events. We end this chapter by discussing the lessons that can be learned from the Boston Marathon bombing in order to protect participants of open-air sporting events while maintaining positive and functional relationships with the broader community.

Protecting Future Sporting Events

Marathons present a unique and difficult challenge for those seeking to prevent even the most mundane and spontaneous of crimes, let alone planned acts of terrorism. Covering an area more than 26.2 miles in length, the marathon is a target-rich environment, with high-density congregations of people, cultural significance, and widespread media coverage. Complicating matters further, the threats to the crowd can easily come from the crowd (Hoggett and Stott, 2010). Although this may seem unimportant to those who seek solely to reduce and deter individual acts of terrorism, prevention tactics, such as provocative policing, could incite crowd members, thus causing a new source of disorder (Shellow and Roemer, 1966). With this in mind, many of the strategies to reduce the risk of crime or terrorism within marathons and similarly scaled sporting events have drawn upon Situational Crime Prevention (SCP) techniques, which seek to minimize crime opportunities in often subtle and unobtrusive ways (Clarke, 2005; Sutton, Cherney, and White, 2013).

Situational Crime Prevention, Sports, and Terrorism

SCP posits that opportunity is an important cause of crime, whereby “reducing opportunities for specific crime will reduce the overall amount of crime” (Clarke, 2008:180). Although normally used to prevent crimes such as theft, graffiti, and assault (Felson and Boba, 2010), it has been argued that strategies to prevent terrorism are similar to those for traditional types of crime (Clarke and Newman, 2006). Officials should first reinforce potential vulnerabilities that could be exploited by terrorists. Second, they should anticipate likely adaptations to attacks as perpetrators attempt to circumvent reinforcements (Clarke and Newman, 2006). Finally, all SCP measures must be implemented in partnership with both public and private agencies (Clarke and Newman, 2006). Evidence of SCP in the aftermath of the Boston bombing includes the reinforced security in the Boston transit system and area trauma centers, as both were assessed to be attractive and vulnerable secondary targets. The remainder of this section delineates methods that have been used to limit future terrorist opportunities.

Clarke and Newman (2006) introduce a framework for predicting potential terrorist targets using the acronym EVIL DONE, arguing that an attractive target would rank highly in one or more of the following criteria: Exposed, Vital, Iconic, Legitimate, Destructible, Occupied, Near, and Easy. It can be argued that, with the exception of vital,⁴ the annual Boston Marathon meets all of these criteria. Yet despite the high predictability of EVIL DONE in this single case, the acronym produces a high false-positive rate (i.e., most marathons meet the criteria, but are never targeted by terrorism). Further, the marathon is only one of many sporting mega-events, and although fear and security concerns about terrorism risk are common, acts of terrorism at these events are still particularly rare (Atkinson and Young, 2012). Indeed, despite the countless thousands that have taken place, only 168 out of 76,135 terrorist attacks between 1972 and 2004 were related to sports in any way (Toohey and Taylor, 2008).⁵ Thus, while the marathon and other major sporting events are potentially attractive targets for terrorists, very few have been selected (Clarke and Newman, 2006).

Incorporating Situational Crime Prevention to Prevent Terrorism

Situational crime prevention offers more than target prediction, as it also provides a platform to strategically restrict criminal opportunities by reducing the attraction of events to perpetrators. Perhaps the vast expenditures devoted to security at sporting events explain the low number of attacks at these events. Since the September 11 attacks, security spending at the Olympics has increased dramatically. Snider (2002) attributes \$70 million USD of the \$500 million safety budget used for the 2002 Salt Lake City Olympics solely to reduce terrorism risk. Security expenditure peaked in the 2004 Athens Olympics, with more than \$1.5 billion USD spent on military and police patrols, as well as numerous forms of electronic security measures (Coaffee, Fussey, and Moore, 2011).

Despite the amount of money spent on security, open-air public events are particularly vulnerable to crime and have been targeted by terrorists in the past (e.g., 1972 Munich Olympics, 1996 Atlanta Olympics). These events are especially attractive soft targets, as they guarantee a high crowd density, are relatively accessible, and are guaranteed a high degree of media exposure (Coaffee, Fussey, and Moore, 2011). Although SCP would advocate changing these features to reduce risk, their social and cultural importance precludes restricting the events in this way. Indeed, while there is great pressure to ensure security for large-scale sporting events, there is also the desire to make this presence as unobtrusive as possible so as not to diminish the “spirit” of these events, thus creating the tension between security and freedom.

Yet the perpetrators of the Boston Bombings could have been detected well before the attack, thus preventing it in the first place. Tamerlan Tsarnaev, a known security risk, was able to access suspicious materials without triggering alarm. This reveals the necessity of integrating data across intelligence agencies and merchants that sell sensitive materials. Further, authorities can reduce opportunities for terrorism in open-air sporting events by further restricting the goods that participants can bring to the events. Were the Tsarnaev brothers unable to bring their backpacks to the marathon site, the explosions would have been averted. Of course, such a restriction requires that participants pass through a checkpoint to reach the event, thereby limiting accessibility. However, the public has shown an increased willingness to accept some restrictions in order to assure security. Incorporating bag searches, increasing formal and informal surveillance, and limiting the maximum capacity in viewing areas reduce the risk of terrorism, with minimal disruptions to the crowd. Indeed, such measures have been successfully

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integrated into stadium-based sporting events (Salsberg, Smith, and Sutherland, 2014).

If prevention fails, a strategy to reduce the number of human casualties could be to redistribute the density of marathons more evenly throughout the course. While attempts to diminish the attractiveness of the finish line could impair the cultural value of the event, marathon planners could follow the lead of other events and incorporate other attractive points throughout the route. Professional cycling events, such as the *Tour de France* and the *Giro D'Italia*, have created interest in areas other than the finish by awarding points and awards for those who complete specific sections of the course in the fastest time (the fastest in climbing hills or sprinting in flat areas, for example). By incorporating alternative attractions along the marathon route, its overall appeal could be enhanced and the crowd might be more evenly dispersed, in turn minimizing casualties from an isolated attack.

Marathon Measures Incorporated Since Boston 2013

In the time since the Boston Bombing, many major sporting events have incorporated successful elements used in Boston and have sought to foster similar criminal justice, civilian, and medical coordination. Public speeches cite the Boston Marathon Bombing as an indicator of current threat. For example, Russian President Vladimir Putin used the Boston Bombing to justify the intense security at the 2014 Sochi Winter Olympics (Charlton, 2014). However, major event organizers were well aware of the risk prior to the Boston bombings. For example, the organizers of the 2012 London Olympics state that securing the 26.2 mile marathon route was one of the most difficult security challenges they faced (Gibson, 2013). Regardless, the 2012 London Marathon went ahead as planned with a member of the UK's Royal Family in attendance (Davies, 2013; Gibson, 2013).

Reestablishing the culture of the marathon since Boston has become a priority among marathon organizers. The planners of the 2013 London Marathon have asserted both resilience and the unwillingness to let a sporting event that embodies the indomitable human spirit to be tarnished (Davies, 2013). That event included tributes to the victims of the Boston Bombing with 30 seconds of silence prior to the start of the race and black ribbons worn by runners (Davies, 2013). As public support and increased attention could have made the London Marathon an attractive target for an attack, increased security reduced its risk of being targeted. Security personnel hand-searched all bags carried by credentialed media and staff at each entrance, and runners were required to place spare clothing and other belongings in red plastic bags provided by race organizers (Ford, 2013). The organizers increased the security around the finish line, including a mixture of British soldiers and uniformed police officers (Ford, 2013). Organizers of this and the 2013 Madrid Marathon explicitly cited the bombings in Boston as a reason to expand security despite no detected risks prior to the event (Associated Press, 2013). The Madrid Marathon organizers deployed 400 National Police officers, 1,100 other security personnel, and a specialized rapid-reaction and prevention force to increase the safety of the event (Associated Press, 2013).

Boston officials also responded to the 2013 attack by implementing precautions for the 2014 Boston Marathon that increased the cultural significance and the iconic value of the race while also reducing opportunity for terrorists. The competitive field was expanded from its previous cap of 27,000 to make room for the runners who were unable to complete the marathon in 2013 due to the explosions and to include the friends and relatives of the bombing victims (Burnside, 2013). To protect the runners and spectators, officials followed the lead of the London and Madrid marathons by increasing police presence, deploying officers throughout the crowd, with bomb-sniffing dogs, on the rooftops, and in police helicopters overhead (Salsberg, Smith, and Sutherland, 2014). Plain-clothed officers were also strategically positioned within the crowd, with bomb-detonation squads and armed National Guard troops on hand (Raasch, 2014). Altogether, 3,500 officers from a wide variety of cities and services were stationed in Boston for the 2014 Marathon (McCluskey, 2014). Technology was also enhanced to better survey and record the event, as officials installed more than 100 cameras along the race route and set up approximately 50 observation points around the finish line to monitor the crowd and surrounding areas (Salsberg et al., 2014).

Officials had also increased security and medical response capacity throughout the length of the marathon route. For the first time in the history of the race, all eight cities and towns along the route employed a dedicated local emergency operations center (McCluskey, 2014). Spectators were also required to go through tight security checkpoints before being allowed near the start point (Associated Press, 2014). Officials required that those participating in the marathon keep their belongings in clear plastic bags, while forbidding backpacks, handbags, or any similar item carried over the shoulder (Associated Press, 2014). The 2014 Boston Marathon also prohibited a number of cultural elements that could potentially be exploited by terrorists. Unregistered runners, known as

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“bandits,” who have traditionally joined the race were prohibited in 2014 (Associated Press, 2014). Officials also prohibited costumes that covered the face; non-form-fitting, bulky outfits; and signs or flags larger than 11 inches by 17 inches (Associated Press, 2014).

Despite these changes, the 2014 marathon raised a record \$38.4 million (USD) for charity, nearly doubling the amount raised in 2013 (Crimaldi, 2014). All told, the race occurred without major incident, and the resilience of the crowd was evident with thousands displaying “Boston Strong” t-shirts and placards (Crimaldi, Moskowitz, Ellement, and Finucane, 2014). This success demonstrates that security need not come at the expense of enjoyment, culture, and the sense of community, as Boston continues to recover from the 2013 attack:

In some ways, it seemed like a typical Boston Marathon, normally a colorful spectacle that coincides with a Red Sox game and a Patriots Day reenactment of the Revolutionary War Battle of Lexington ... the attack was not far from many people's minds. Some were anxious. But many were defiant and determined not to let the attack change their enjoyment of a rite of spring in Boston

(Crimaldi, Moskowitz, Ellement, and Finucane, 2014:1).

Conclusion

The 2013 Boston Marathon Bombings were the first terrorist attack since September 11 that affected a large crowd in a public space. Yet despite the scarcity of attacks over more than a decade, emergency responders and the public were ready to respond. Law enforcement throughout the United States had been training with other emergency responders to operate efficiently and effectively when mass casualty events occur. Social media have changed the way that we communicate by allowing more to participate in investigations and disseminating images and video to those who may identify perpetrators. With these things in place, the perpetrators of the attack were identified and safely captured within a week of the bombings. Perhaps responses could have operated more smoothly. Information was imperfect at times, causing confusion and missed opportunities. Yet the response team succeeded in preventing a secondary attack and the perpetrators were captured with minimal damage.

Despite these successes, more resources should be directed toward prevention to minimize the risk of any casualties from terrorist attacks at open-space sporting events. Such events celebrate the ideals of freedom and human capacity to achieve. Marathons since the Boston attack have successfully preserved these ideals while assuring the safety of participants. While it is impossible to reduce risk to zero, strategic security investments can keep terrorist attacks at bay and out of the minds of participants.

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(¹) <https://www.fema.gov/national-incident-management-system>, accessed December 8, 2014.

(²) http://www.mbhsr.org/?page_id=24, accessed December 9, 2014.

(³) The following agencies participated in the command post: Boston Police Department, the Massachusetts Bay Transportation Authority Police Department, the Massachusetts State Police, the National Guard, the Massachusetts Emergency Management Agency, the Massachusetts Department of Transportation, the FBI, the United States Secret Service, the Bureau of Alcohol, Tobacco, and Firearms, and the police departments of various colleges and universities in the area (Leonard et al., 2014).

(⁴) The *vital* criterion refers to the idea that targets that are critical to a society's day-to-day functioning or even its survival would be targeted (Clarke and Newman, 2006:94). As the city of Boston would function similarly without this event, the Boston Marathon does not appear to meet this criterion.

(⁵) The 76,135 figure was calculated from the Global Terrorism Database for those years (<http://www.start.umd.edu/gtd/>).

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