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Implementing NIMS: Lessons Learned from the Boston Marathon Bombing

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Implementing NIMS: Lessons Learned from the Boston Marathon Bombing

Abstract

Many opportunities to learn from the 2013 Boston Marathon bombing have not been capitalized on. The terrorist attack was launched in the heart of Boston, a densely populated urban area with a population of approximately 670,000. Those numbers are amplified by the hundreds of thousands of spectators that line the streets along the Marathon route, with most at the finish line on Boylston Street. Two pressure cooker bombs were detonated in the finish line area, killing three and injuring 264. Among the injured were 16 who suffered traumatic amputations. Numerous reviews of the response and investigation identified positive aspects to be expanded upon and others needing improvement. This monograph presents lessons learned within the context of the National Incident Management System. Individuals that responded to and investigated the attack provide insights into what went well and, more importantly, what didn't, in the days and weeks following the attack. How would the proper implementation of Unified Command have improved outcomes? Find out from those who were there, have separated from service, and are now free to speak. The lessons presented provide critical guidance for the proper preparation for and response to terrorist attacks in urban environments.

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Introduction

The 2013 Boston Marathon bombing was the first successful terrorist attack on American soil since September 11, 2001. The targeting of a televised event in a densely populated urban area captured the public's attention and spread fear throughout the greater Boston region. The response and investigation of the bombing present critical learning opportunities that have yet to be realized. Lessons have been offered in official reviews of the response and investigation, and another focused on information sharing before the bombing.[1] Physicians and medical researchers have provided voluminous articles on the types of injuries suffered by victims of the bombing and techniques used to save their lives.[2] Public safety professionals and security pundits have provided opinions and insights on lessons to be learned from the response and investigation.[3] The latter are often derived from interviews with current and former law enforcement executives and politicians encumbered by policies and pressure to defer to the official narratives of the time.

This article employs the qualitative research method of collaborative autoethnography to examine lessons learned within the context of the National Incident Management System (NIMS) and Incident Command System (ICS). The authors were intimately involved in the response and investigation of the bombing. They have since separated from service to their respective agencies, allowing them to express personal views on their experiences. The focus on learning opportunities within the context of NIMS and ICS supports the objective analysis of processes and mitigates subjective perceptions of the performance of individuals involved in the response and investigation.

The prior research and official reviews have not revealed essential lessons to be learned from the Marathon bombings. The infrequency of incidents such as the Marathon bombings contributes to the importance of capitalizing on the available learning opportunities. Official reviews of the attacks and the subsequent manhunt have been informative but do not offer the granular lessons learned by those immersed in the daily operations of the response and investigation. The information contained in this article provides details on critical lessons learned throughout the incident. The lessons learned from this article will assist policymakers in

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preparing for and responding to terrorist attacks and other mass casualty incidents (MCIs) in urban areas.

A review of the prior literature follows an overview of NIMS and ICS. The authors present the literature review in two sections:

1. A presentation of the scholarship on NIMS and ICS
2. Research and official reviews of the response and investigation of the Marathon bombing

The literature review specific to the Marathon bombings focuses on previously identified issues and best practices. The authors gleaned most of the information from the official after-action review conducted by the Massachusetts Emergency Management Agency (MEMA) and present findings within the context of the three major components of NIMS:

1. Resource management
2. Command and coordination
3. Communications and information management[4]

The authors explain the methodology used for the study, followed by a presentation of lessons learned. The Lessons Learned section presents novel lessons learned and expands upon concepts presented in the Literature Review by providing detail and context not provided by the prior research. The lessons learned are presented within the context of the three major components of NIMS, as was done in the Literature Review section. The authors further disaggregated information presented in the Lessons Learned section into three parts:

1. Things done well
2. Issues needing improvement
3. Recommendations

The authors discuss their findings and the implications for practitioners and policymakers in the Conclusions section of this article.

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Overview of NIMS and ICS

Since 2004, NIMS has provided various government and private sector levels with a framework to "prevent, protect against, mitigate, respond to, and recover from incidents."[5] NIMS evolved from a system developed in the 1970s to combat forest fires in California. In the wake of the 2001 terrorist attacks, the Department of Homeland Security (DHS) recognized and promoted the system nationally.

The characteristics of NIMS make it applicable to all levels of government and the private sector for all sorts of planned and unplanned events. NIMS's standardized framework and vocabulary equip disparate federal, state, local, and tribal partners to work together effectively.[6] The system is scalable and flexible, allowing users to adjust their level of response as incidents expand and contract.[7]

The ICS component of NIMS offers a framework to command and manage incidents of any type.[8] Unified Command is a command structure within ICS that effectively manages incidents involving functional or jurisdictional overlap.[9] Terrorist attacks in urban areas are often multijurisdictional, and MCIs are inherently interdisciplinary. In a Unified Command, individuals chosen by their respective agencies jointly determine objectives and manage resources.[10] Among Unified Command's benefits are promoting a common operating picture among the involved agencies and unity of effort, a guiding principle of NIMS. Unity of effort is defined as "coordinating activities among various organizations to achieve common objectives."[11]

The Command and General Staff in a Unified Command are critical to effective incident management. A typical Command Staff includes a Public Information Officer (PIO), a Liaison Officer, and a Safety Officer.[12] General Staff positions are held by Section Chiefs appointed by the Incident Commander or Unified Command. Those sections are Operations, Planning, Logistics, and Finance and Administration.[13] The Operations Section Chief is responsible for designating a staging area proximate to but away from the Incident Command Post (ICP).[14] A staging area manager assigns and tracks resources, including personnel, ready for deployment.[15]

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Literature Review

NIMS and ICS

The empirical research on NIMS and ICS is relatively new and growing.[16] Prior research findings on the topic indicate disagreement on the framework's utility. Practitioners tend to recognize the benefit of the system.[17] Practitioners' support is contrasted with scholars, who often contend that such command-and-control models are archaic and ineffective.[18] Scrutiny of arguments presented by both sides indicates a common theme: That commitment to the system coupled with training and experience implementing the framework is critical to its success.

Practitioners supporting NIMS and ICS cite the framework's flexibility and scalability, making the system applicable to routine calls for service and significant events.[19] Routine use of the system, training, and interdisciplinary joint exercises with partners at all government levels equip practitioners to implement the framework during a crisis effectively. The ICS framework provides structure to multi-jurisdictional, multi-disciplinary responses to crises that may otherwise devolve into chaos.[20]

Arguments against the efficacy of NIMS and ICS often deride the use of command-and-control structures. Those opposed to ICS often favor incident management models using collaborative networks rather than the top-down, bureaucratic characteristics of the current system.[21] Academics dislike ICS partly due to their misperception of it as a rigid, command-and-control military model that curbs decision-making by those in the field.[22]

Networks are essential to incident management but lack the structure to maintain control over MCIs, such as terrorist attacks in urban areas. At least one empirical study found that existing collaborative networks were important to effective emergency management.[23] MEMA's after-action report of the Marathon bombing cited the existing interagency relationships as a strength of the response efforts.[24]

Those opposed to the frameworks also cite refusal to accept the system or poor implementation as weaknesses of the model. For example, a meta-analysis of the prior research on ICS presented evidence of the system's

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ineffectiveness: “The ICS may not work as designed all of the time. More than one study identified variation in the degree to which the ICS was used, if it was used at all, in incident response, as well as a lack of use daily.”[25] This argument against the efficacy of ICS suffers from faulty logic. A reasonable inference from the evidence presented indicates support for the inverse of the original idea: That acceptance of the system coupled with proper training and experience are critical to the successful implementation of the system. Nonetheless, the refusal to fully adopt NIMS and ICS persists.[26] Others have found that ineffective training and lengthy times between training and use of the system curb its utility.[27] The core principles of NIMS and ICS “cannot be compromised without losing the effectiveness and performance for which ICS and NIMS have become so highly regarded.”[28]

At least one prior study found that ICS worked best for events limited in duration, objectives, and scope.[29] However, any incident management system would work best under the stated conditions. Rather than accept the assertion as an indictment of ICS, it is crucial to recognize that the vulnerability is not within the system but the knowledge and experience of the user. Implementing ICS properly is critical to effectively managing a protracted, complex incident such as the Marathon bombing.

The Boston Marathon Bombing Response and Investigation

Various agencies and individuals have conducted official reviews and studies of the Marathon bombing response and investigation. Concepts and themes outside the boundaries of NIMS and ICS are beyond the scope of this article. For instance, the Inspectors General of the Intelligence Community reviewed the handling and sharing of information before the attacks.[30] The House Homeland Security Committee Report focused on internal FBI investigative processes and addressed restrictive language in memoranda of understanding with Joint Terrorism Task Force partner agencies.[31] Only the review conducted by the Massachusetts Emergency Management Agency (MEMA) addressed operational management issues.[32] Although MEMA’s study offers many lessons to be learned, the information provided is of a higher level. It lacks the granularity offered by those on the ground for 24x7 operations.[33] The MEMA review also emphasizes the positive aspects of the response phases and ignores command and control issues that plagued day-to-day operations.[34]

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Resource Management

Boston's public safety and medical professionals did an admirable job preparing for events such as the Marathon bombing, especially regarding qualifying and certifying personnel. Numerous greater Boston and Massachusetts exercises prepared the region for MCIs.[35] In 2011, Operation Falcon II prepared Boston hospitals to respond to MCIs and identify their response deficiencies.[36] Urban Shield Boston is an annual exercise held just five months before the Marathon bombings and included more than 600 individuals from 50 agencies of assorted disciplines spanning the various levels of government.[37] The 2012 Urban Shield event revealed weaknesses in the interagency communications between the Boston Police and Fire Departments that were rectified before the 2013 Marathon.[38] The Boston hospitals' extensive emergency preparedness efforts and response capabilities saved many lives. The hospitals' participation in multi-disciplinary drills contributed to the speedy and effective treatment of the many injured.[39] Finally, the annual Pre-Boston Marathon Tabletop Exercise hosted by the Massachusetts State Emergency Operations Center promoted partnerships and the opportunity to practice with the Web EOC emergency management software used during the Marathon.[40]

Formal mutual aid agreements between law enforcement and EMS agencies were critical to effectively responding to the bombings.[41] Explosive Ordinance Disposal assets throughout New England were acquired via the New England State Police Compact.[42] The Boston Police Department (BPD) activated mutual aid from surrounding communities and the Transit Police.[43] Robust mutual aid agreements among EMS agencies facilitated a speedy response from many assets.[44]

Despite the utility of existing mutual aid agreements, self-deployment by law enforcement officers created chaotic and dangerous situations. Self-deployment contributed to the disarray and poor muzzle discipline in the shootout with the bombing suspects and the following day, when officers opened fire on the boat the second suspect was hiding in.[45] Incidents of self-deployment violated NIMS' tenets regarding mutual aid and created officer safety issues.[46] In 1956, sociologists coined the term "convergence" to explain humans' desire to provide help by converging on disaster

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areas.[47] Officers must resist the innate desire to converge on disaster areas and remain aware of the threat posed by multi-pronged, Mumbai-style attacks. In addition to creating a chaotic response to the immediate threat, self-deploying officers expose their assigned area of responsibility to risk.

The MEMA report recognized the failure to provide adequate relief for state and local law enforcement officers.[48] It is commendable that the developers of the report acknowledged the stress and fatigue experienced by officers. Still, the importance of this deficiency is minimized by the short thrift it was afforded in the report. In their review of the Marathon bombing, Leonard et al. recommended "depth of leadership" to allow proper rest for senior management.[49] The authors present further details in the Lessons Learned section of this article.

Command and Coordination

MEMA's review relative to the implementation of ICS focused overwhelmingly on the positive while acknowledging some deficiencies. Executive leadership was commended for establishing a Unified Command Center (UCC) at the Westin Hotel within approximately forty minutes of the explosions.[50] The UCC provided a location for executive leadership of the various agencies to meet with elected officials and disseminate information to the public.[51] The site of an appropriate UCC should have been identified during the planning phase.[52] The generosity of the Westin Hotel was appreciated, but the venue lacked the telephones, electrical outlets, and computers required by responding personnel.[53] By approximately 6:30 p.m., there was agreement that the responsibility for the investigation would transition from BPD to the FBI's Joint Terrorism Task Force.[54] An incident command post (ICP) was established at FBI Boston headquarters, and the UCC at the Westin Hotel was closed the next day.[55] The review ignores that another UCC wasn't established until the manhunt in Watertown, four days after the attacks. Leonard et al. opined that senior management effectively implemented the core principles of NIMS and that implementation suffered at the operational level.[56] Nonetheless, MEMA did acknowledge that leadership at the Watertown UCC failed to brief or provide direction to the thousands of officers who responded to assist.[57] The review also observed that a Logistics Section Chief and Staging Area Manager should have been established to manage

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resources.[58] Further details are provided in the Lessons Learned section of this article.

Communications and Information Management

The loss of cellular service after the explosions and ineffective radio communications were two deficiencies identified by the MEMA review.[59] After the explosions, the many calls to and from individuals around the finish line overwhelmed the available cellular service. The after-action report acknowledged that cellular voice communications were unavailable but that text messaging remained available.[60] However, the availability of text messaging was intermittent at best. A Cell-On-Wheels was transported to the scene within an hour of the blast and facilitated cellular communications.[61] "Wireless Priority Service (WPS) is a White House-directed cellular communications service provided and managed by CISA in compliance with Federal Communications Commission (FCC) Report and Order, FCC- 22-36."[62] The service would have been available to many first responders but was not active on many of their devices.[63] Radio communications were saturated because of poor radio discipline and the failure to utilize channels designated for Marathon Operations.[64]

Public messaging was best during the two phases when a UCC was established. The MEMA review acknowledged that the partners should have found a Joint Information Center (JIC) on Tuesday after they shut down the Westin Hotel UCC.[65] The failure to implement a JIC resulted in uncoordinated, often conflicting public messaging.

Methodology

This article employs collaborative autoethnography to examine and draw conclusions from the authors' experiences. This qualitative approach is "grounded in the simple yet potent proposition that a deep understanding of social phenomenon resides in the individuals who can make sense of their own experiences."[66] Autoethnography has been an accepted research method since the 1980s and is grounded in three critical characteristics.[67] First, the research is based on "insider self-knowledge."[68] Second, it emphasizes participation and crucial assessment of personal and joint experiences.[69] Finally, the experiences of the researchers are understood within one of many interdisciplinary contexts.[70]

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Using established theoretical frameworks in empirical studies provides structure to complex topics. In addition to guiding and organizing the examination of the topic, using established frameworks equips future researchers to build upon the prior research more readily. Rather than using a theoretical framework, this article considers the authors' experiences within the operational frameworks of NIMS and ICS. Using an operational rather than theoretical framework contributes to the utility of this article by deviating from the abstract in favor of the concrete.

As with any research, this study has limitations. The qualitative methods employed in the study provide thick descriptions not found in quantitative studies but lack the objective measurement of quantifiable data. The information contained herein is limited to the experiences of the three authors and their perceptions of those experiences. The authors' experiences are not necessarily generalizable or predictive.

Lessons Learned

The lessons presented in this section include new themes and the elaboration of concepts presented in the literature review. Further detail, context, and emphasis are applied to issues identified by the prior research. The authors organized this section by each of the three major components of NIMS:

1. Resource management,
2. Command and coordination, and
3. Communications and information management.

The authors explain things done well, issues needing improvement, and recommendations for each component.

Resource Management

Things Done Well

The FBI Boston Division fostered an environment that embraced partnerships with their state and local partners. The two partners contributing the most significant number of personnel to the FBI Boston

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Division Joint Terrorism Task Force (JTTF) were the Massachusetts State Police (MSP) and the BPD. The MSP and BPD also administer the two fusion centers within the Commonwealth of Massachusetts, with local, state, and federal partners embedded within each. The particularly robust daily activities at each fusion center forged partnerships among stakeholders at the various levels of government.

The inclusive environment promoted by the FBI and the fusion centers, coupled with extensive planning and preparation, resulted in proper certifying and credentialing of personnel. The overclassification of intelligence products often obfuscates information sharing, especially between federal agencies and their state, local, and tribal partners.[71] The FBI and DHS mitigated issues of overclassification by proactively credentialing state and local partners with the appropriate security clearances.

Issues Needing Improvement

Several issues presented in the Literature Review section are worthy of elaboration. The intense, protracted response and investigation revealed a critical weakness: the failure to rest personnel sufficiently. Worth noting is that 24-hour operations continued for 11 days, or one week after the second suspect was taken into custody. Also, the bombs exploded towards the end of a long day for many of the personnel assigned to FBI Boston's JTTF. Twelve-hour shifts were implemented by the FBI, BPD, and MSP but were not effectively enforced. Dedicated investigators and analysts were exhausted within days because superiors did not require them to leave when their shifts ended.

Comprehensive mutual aid agreements are exceedingly necessary for urban areas, where incidents such as terrorist attacks are inherently multijurisdictional and multidisciplinary. The critical concepts of NIMS and ICS must be incorporated into mutual aid agreements. Executive leadership must ensure that funding mechanisms are established and vendors identified to provide supplies, food, and office equipment (the authors provide details of these deficiencies in this article's Command and Coordination section). Plans should also incorporate funding for hotels or identification of other facilities to rest personnel not residing in the immediate area.

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Executive leadership must prepare to establish command and control quickly to manage the influx of responding mutual aid resources.[72] It is estimated that as many as 2,500 officers converged on Watertown to assist with the search for the second suspect.[73] Although some responded from as far away as New York, terrorist attacks in densely populated urban areas will likely spawn a rapid, overwhelming response from neighboring communities that managers must be prepared for. The authors provide more detailed information on resource management issues in this article's Command and Coordination section.

Recommendations

All personnel should leverage fusion centers and task forces to build meaningful relationships. Individuals should not be handing out business cards during a crisis. To mitigate fatigue in the case of an incident occurring during a pre-planned event, stagger shifts when possible or assign personnel as alternates so they may relieve others as necessary. Supervisors and managers must enforce strict adherence to restrictions on work hours. Executive leadership should collaborate with state and local partners to devise funding mechanisms and assign expense responsibility. Executives should establish relationships with federal partners at DHS and the Department of Justice to identify and remain abreast of possible disaster funding mechanisms. Consistent with the recommendations made by MEMA, the management of mutual aid resources requires training and policies that emphasize the orderly response of assets as directed by an identified incident commander.[74]

Command and Coordination

Things Done Well

Detective supervisors from the BPD and MSP responding to the scene of the bombing quickly established an ad hoc command post at the California Pizza Kitchen one block from the finish line. The investigation began immediately, with the field supervisors coordinating efforts and maintaining a common operating picture. Detectives coordinated with special agents from the FBI and ATF to respond to investigative leads, including following at least one suspect to the hospital. The California

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Pizza Kitchen command post was closed in deference to the UCC established by executive leadership several blocks away at the Westin Hotel. Personnel assigned to the command post established at FBI Boston for Marathon operations expanded the space within several hours to serve as the Incident Command Post (ICP). The ICP would accommodate the influx of partners from all levels of government.

Issues Needing Improvement

Critical concepts of NIMS were implemented well during the initial response but much less so during the protracted response and investigation. The contention that senior management effectively implemented the core principles of NIMS was inaccurate.[75] Beyond the initial establishment of the UCC at the Westin Hotel, NIMS was implemented poorly by senior management of the involved agencies and never improved throughout the event. The situation deteriorated as consequences of the poor implementation of NIMS became increasingly evident throughout the eleven days of 24x7 operations.

Unified Command

The benefits of the structure provided by Unified Command and the flexibility of NIMS were needed but rarely utilized in Boston. Although the FBI assumed primary jurisdiction the evening of the attack, the investigation remained a joint effort between the FBI, BPD, and MSP. In addition to being the major partners for FBI Boston's JTTF, the crime scene was within the jurisdiction of BPD, and evidence processing took place at Black Falcon Pier, within the MSP's jurisdiction. The need for a Unified Command structure was amplified when it became apparent that one of the bombers was suspected of an unsolved triple homicide being investigated by MSP detectives assigned to the Middlesex District Attorney's Office.[76] A prosecutor and detectives from the Middlesex District Attorney's Office became a regular presence at the ICP.

Executive leadership only implemented Unified Command in purely tactical applications rather than using the command structure to manage the rapidly evolving environment throughout the first four days. The speedy implementation of a UCC within 40 minutes of the attack was commendable. However, after the UCC at the Westin Hotel was closed the

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day after the attack (Tuesday), another wasn't established until Friday morning. The partners established the second UCC in Watertown to manage the search for the remaining suspect after the killing of Officer Sean Collier and the subsequent shootout.[77]

An active UCC at FBI Boston would have mitigated some of the issues of mutual aid and jurisdiction arising from the Watertown incident. FBI and MSP superiors both declared command over the extensive crime scene. The FBI assumed the Watertown suspects were also the Marathon bombers, and the MSP made no such assumptions. The MSP recognized the incident as a likely homicide and multiple officer-involved shootings to be investigated by MSP detectives assigned to the Middlesex District Attorney's Office. Troopers from the MSP Anti-Terrorism Unit maintained custody of the suspect until he was declared deceased and transferred to the control of the Chief Medical Examiner. Having senior representatives from the FBI and MSP seated in a UCC would have promoted the need to work together towards a common goal. The authors provide further details of the Watertown incident in this article's Communications and Information section.

Intelligence and Investigations

The failure to implement NIMS and ICS in Boston precluded the proper placement of investigations and intelligence within the command structure. It curbed the appropriate sharing of information and intelligence among stakeholders. ICS recognizes that terrorist attacks in urban areas may require the intelligence and investigations function to be moved from the Operations or Planning Section to a more prominent position in the Command Staff or as a separate function within the General Staff.[78]

Regular briefings at the ICP to update partners were not enough to overcome weaknesses created by the lack of formal structures provided by NIMS and ICS. Informal back-channel networks filled the vacuum created by ineffective information sharing, which impacted the promoting of a common operating picture for the involved stakeholders. The authors provide further details regarding the sharing of information in the Communications and Information Management section of this article.

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The partners' failure to formally establish a command structure to manage the investigation impacted NIMS's unity of effort principle. The duration and multi-pronged investigation contributed to varying viewpoints among the many individuals involved. The leadership of partner agencies sometimes allowed contrarian subordinates to pursue alternative investigative angles intended to disprove the FBI plan.

Staging Area

The failure to establish a staging area away from the command post at FBI Boston impacted several aspects of the response and investigation. The many federal agencies arriving at FBI Boston offering help were welcomed and given a seat in the ICP. Boston Police Department and MSP detectives not assigned to FBI task forces also responded to FBI Boston, awaiting the assignment of tips and leads.

The FBI's benevolence, coupled with the failure of the partners to establish a staging area away from the ICP, resulted in too many people in the ICP. The number of people granted access to the ICP overwhelmed resources and FBI Boston's facilities. Elevators and bathrooms closest to the ICP were intermittently but frequently out of service from overuse. As the investigation continued, personnel assigned to the ICP were forced to walk increasingly further distances to find operable bathrooms. Copy machines also became inoperable in order of their proximity to the ICP. Scanners were then used to make copies, rendering the scanners out of service. FBI management's failure to plan for the increased activity also resulted in overflowing trash receptacles throughout the facility.

The number of superfluous individuals allowed access to the ICP likely impacted operational security (OPSEC) and may have contributed to the frequency of leaks to the media. Investigators were concerned about sharing sensitive information during operational briefings due to the frequency of that information appearing on the news in the minutes and hours after the briefing. The leak of the suspects' images to the media likely influenced their crime spree that began with the murder of a police officer and culminated in a shootout with police in Watertown. The authors discuss the leaks in greater detail in this article's Communications and Information Management section.

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Safety

The primary duty of ICS leadership is to promote the safety of all personnel involved in an incident.[79] The Safety Officer holds a position within the Command Staff of the ICS framework and is tasked with ensuring the safety of the operation.[80] The failure to implement a staging area away from the ICP weakened routine security protocols at FBI Boston. The FBI had unarmed security staff in place to regulate access to the ICP but did not deploy armed security to the exterior of the building until the manhunt for the second suspect, four days after the bombings.

Logistics Section

The proper implementation of ICS would have included appointing a Logistics Section Chief.[81] The Logistics Section's functions include providing food and repairing facilities and office equipment.[82] Establishing a Logistics Section in Boston would have mitigated some of the issues presented by the absence of a staging area. In addition to addressing problems with the facilities and office equipment, a Logistics Section would have facilitated the provision of food for investigators and intelligence analysts assigned to the ICP.

Food was provided intermittently through donations from local businesses near the ICP and was most often quickly consumed by onlookers from federal and state agencies not assigned to the ICP. None of the partner agencies had established accounts to fund food purchases. Rather than establishing funding mechanisms and vendors in the planning stage, managers of the Marathon bombing investigation relied on the intermittent charity of neighboring restaurants to feed their personnel.

Recommendations

The ICS is a system of interdependent components that works well when properly implemented. A deficiency in any component will affect the others. All stakeholders must embrace ICS as their incident management model and commit to training and practicing the system in frequent, interagency, interdisciplinary exercises. The flexibility and modularity of the system make it amenable to regular use in all types of situations, which facilitates opportunities to practice implementing the system.

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Practitioners should take advantage of opportunities to employ ICS during pre-planned events to improve their proficiency with the system during an emergency.[83] The partners should have established and maintained a UCC at FBI Boston throughout 24x7 operations. The failure to implement a staging area away from the ICP in Boston is a compelling learning opportunity. Establishing a staging area away from the ICP will help to manage resources and dissuade onlookers. When presented with a large-scale incident such as the Marathon bombing, do not overlook the obvious, such as providing security for the involved facilities and personnel. The assigned personnel must be fed and hydrated, no matter how tough and dedicated. Managers and supervisors must establish protocols in the planning phase to identify vendors, establish funding mechanisms, and determine financial responsibilities amongst partner agencies.

Communications and Information Management

Things Done Well

Public messaging was at its best during the two periods that a UCC was established: Immediately after the attacks and during the search for the second suspect. However, communications and information management were most often handled quite poorly. Issues needing improvement are presented in the following section.

Issues Needing Improvement

The failure to implement NIMS and ICS impacted public messaging and communications internally among stakeholders. The lack of a JIC affected the ability of officials to manage voluminous requests for information from media outlets.[84] Also, the partners never established the Command Staff positions of Public Information Officer (PIO) and Liaison Officer, despite their necessity in Boston.

Internal Communications

A Liaison Officer would have facilitated the sharing of information with partner agencies. Although a Unified Command structure would have been ideal in Boston, a Liaison Officer appointed by a single Incident

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Commander would have mitigated issues created by the unstructured information sharing that occurred. Failing to establish a Liaison Officer and provide structured information to stakeholders fomented distrust among the partner agencies.

The official review by MEMA acknowledged weaknesses in radio communications in the immediate aftermath of the bombing. It explained that personnel were not aware of channels made available for Marathon Day.[85] Although genuine, supervisors' inability to message and direct subordinates to a specific channel required establishing those backup channels before the event. The intermittent and infrequent availability of text messaging exacerbated the situation, contrary to the MEMA report that claimed text messaging was available.[86]

External Communications

The lack of a PIO in Boston was problematic throughout the response and investigation. The appointment of a PIO would have mitigated two critical issues that impacted operations in Boston:

1. The PIO would have established a JIC
2. Establishing a PIO would have reinforced the need for one voice to provide information to the public

The partners' failure to provide structured information to the public through a JIC created a vacuum that likely contributed to the frequency of leaks to the media. The leaks often occurred in near real-time. A prime example of this happened when the U.S. Attorney for the District of Massachusetts, Carmen Ortiz, addressed the issue of leaks during a scheduled briefing at the ICP. She admonished those present (including authors of this article) and reinforced the need for OPSEC, threatening to prosecute anyone determined responsible for leaking information. Attendees stood dumbfounded as the breaking news of them being threatened with prosecution appeared on televisions positioned throughout the ICP soon after the U.S. Attorney left and the briefing proceeded.

At least one official review identified uncoordinated messaging via social media by the various partners.[87] The messy, often conflicting messaging

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took a dangerous turn when a partner agency publicly announced the arrests of several associates of the surviving suspect moments before the execution of the operation. The offending agency's reckless dissemination of information increased the danger for the arrest teams deployed at different locations.

The leak of the suspects' images to the media violated the tenets of NIMS and may have contributed to the killing of Officer Sean Collier of the Massachusetts Institute of Technology (MIT) Police Department. The FBI identified video and still images of the suspects within approximately 32 hours of the attack, but their identity remained unknown to investigators. The BPD pressured the FBI to release the photos of the suspects to the media, but their partners refused. The partners were confident the suspects would soon be identified, and releasing the images would forfeit the element of surprise necessary to take them into custody without incident. The FBI was notified by a Boston media outlet on Thursday (three days after the bombing) that it had the images and planned to release them. The FBI could not convince the media outlet to reconsider and agreed to release the photos during the evening news. Unfortunately, none of the brothers' associates contacted law enforcement to advise of their identity.[88]

As many feared, the brothers went on the offensive shortly after the images were released. Text messages later retrieved from the bombers' phones indicated that the release of the images forced them into action. They first assassinated Officer Collier as he sat stationary in his patrol car on the MIT campus. The bombers then carjacked a Mercedes SUV and kidnapped the operator. Law enforcement tracked the vehicle to a residential area of Watertown, where officers from the Watertown Police Department engaged in a firefight with the older suspect as the younger of the two hurled improvised explosive devices at responding officers.

There has never been an investigation into who leaked the images to the press. The source of the leaks remains unknown, and it would be unfair to assess blame on any individual or agency. Far too many people had access to the investigation's intimate details, and the leaks may not have originated from law enforcement sources.

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Recommendations

To mitigate the risk of being unable to communicate up and down the chain of command, supervisors and managers should establish specific backup radio channels before pre-planned events. A rallying point should also be established in case all communications become inoperable. Frequent, coordinated public messaging is a must. Ineffective provision of information creates a vacuum that exacerbates the risk of information being leaked. The officer safety situations associated with the leaking of information, including the murder of Officer Collier, are a forceful reminder of the importance of OPSEC.

Conclusion

The intensity and duration of the Marathon bombing response and investigation revealed gaps in the preparation and response that present learning opportunities for practitioners and policymakers. Celebrating a job well done must be tempered by the realization that it can be done better. The authors' experiences during the eleven days of 24x7 operations provide critical context and detail not found elsewhere. This study's information and analysis of critical details augment the prior scholarship and official reviews of the 2013 Boston Marathon bombing and investigation. Opportunities to learn from such incidents are thankfully rare. A better understanding of the response and investigation in Boston better prepares the community of first responders and emergency managers to administer future incidents more effectively.

The presentation of lessons learned within the framework of NIMS and ICS reinforces the utility and importance of the model. The difficulties experienced in Boston resulting from the failure to properly establish the critical concepts of ICS reinforce the importance of the framework. Practitioners and policymakers should embrace NIMS and ICS and endeavor to implement the frameworks whenever possible. Executive leadership must develop detailed mutual aid agreements that include protocols facilitating a speedy but managed response under the direction of a clearly identified incident commander. Mutual aid agreements should also articulate financial responsibilities among partner agencies and identify funding mechanisms for essentials such as food, water, rest, and the facilities required for a UCC or ICP. Staging areas must be established

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away from the ICP to avoid overwhelming the facilities and affecting OPSEC. Finally, all personnel must ensure that the time and pressure of protracted incidents do not impact the unity of effort principle.

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