NATIONAL PREPAREDNESS LEADERSHIP INITIATIVE
Harvard School of Public Health
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CRISIS META-LEADERSHIP LESSONS FROM THE BOSTON MARATHON BOMBINGS RESPONSE: THE INGENUITY OF SWARM INTELLIGENCE

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Executive Summary

The Boston Marathon Bombings required leaders agencies scattered over numerous jurisdictions and with different authorities and priorities to rapidly respond together to a complex, ambiguous situation. This report analyzes their leadership through the event. It seeks to understand how they were able to effectively lead an operation with remarkable results. These outcomes are measured in lives saved, suspects quickly captured, public confidence maintained, and population resilience fostered.

These leaders were observed to exhibit a phenomenon in which no one was in charge of the overall response and yet leaders are able to accomplish more together than any one leader could have achieved separately. We liken this to *swarm intelligence.* As evidenced in Boston, the principles of swarm intelligence included: 1) unity of mission; 2) generosity of spirit and action; 3) deference for the responsibility and authority of others; 4) refraining from grabbing credit or hurling blame; 5) a foundation of trust- and experience-based relationships. Confidence, both personal and system, bolstered these leaders individually and as a coordinated force over the 102 hours between the attacks and the conclusion of the incident. They faced difficult decisions in the face of credible risks: Should the public transit system remain open? Should the blurry pictures of the suspects be released? The study found that over the course of the week, they learned how to lead better together as a coordinated and unified cadre of crisis leaders.

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A note on this report: This analysis of the leadership response does not intend to provide a comprehensive account of everything that occurred in the course of the response, which

extended well beyond the 102 hours between the Monday and Friday of that week. Not recounted here are thousands of heroic stories or, no doubt, a number mistakes, missteps, frictions and problems among agencies and their leaders. The intent of this inquiry is to assemble the key leadership lessons learned and to present them so they can be learned, taught, and practiced during future such events. Additionally, this report cannot fully account for the many examples of simple good luck and coincidence that contributed to the outcomes.

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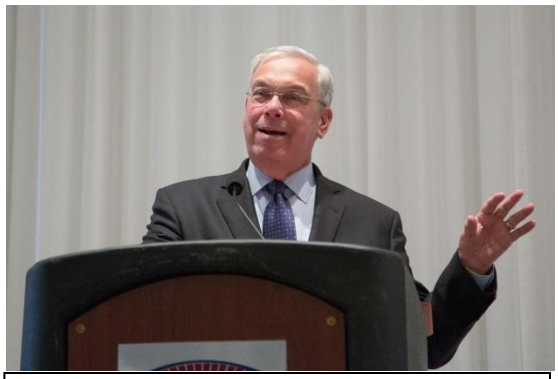
The Boston Marathon Bombing Response and This Study

During the week of April 15-19, 2013, two major crises struck the Boston metropolitan area. On Monday the 15th two improvised explosive devices detonated near the finish line of the Boston Marathon, killing three people and injuring 264. By the early hours of Friday the 19th, the suspects were identified as two young brothers. In a violent confrontation in Watertown, Massachusetts, the two unleashed a barrage of gunfire and explosive devices at responding police officers. In the melee, the older brother, Tamerlin Tsarnaev was wounded, captured, and later died. The younger brother, Dzhokhar Tsarnaev, escaped, leading to an intensive manhunt and the first such terror-related closure of a major metropolitan area in the United States. By Friday evening, just 102 hours after the bombs detonated, the second suspect was apprehended not far from the scene of the shoot-out.

This was an extraordinarily complex set of events. Since 9/11, the United States invested massive resources and effort to mitigate and prepare for just such an attack: an improvised explosive device (IED) detonated at a major sporting or political event (the last such attack occurred during the 1996 Atlanta Olympics, killing one and injuring 111). While there had been numerous preparatory drills and exercises, there had been little real practice or experience.

The explosives were detonated near the end of the 26.2 mile-long Boston Marathon route that traverses eight local jurisdictions. The alleged perpetrators lived across the Charles River in Cambridge and the final shootout occurred in nearby Watertown. Numerous local, state, and

federal elected officials and agency leads all had a role in the response. Businesses, non-profit organizations and private citizens were both affected and active in treating survivors, assisting in the investigation, and fostering community and personal resilience. The action played out in traditional media – who were present in force at the finish line of this internationally broadcast spectacle – as well as in social media. As a result of all these many intersecting dynamics, the decisions facing leaders and the processes to reach them likewise were exceptionally complex.



Former Boston Mayor Thomas Menino shares lessons learned from the Boston Marathon bombing response at the NPLI/MBHSR symposium on April 4, 2014.

The National Preparedness Leadership Initiative (NPLI), a joint program of the Harvard School of Public Health and Harvard Kennedy School of Government Center for Public Leadership, conducted an extensive inquiry into broader crisis leadership lessons derived from the Boston Marathon response. The authors interviewed a wide range of people: leaders of responding government agencies, including the many law enforcement, intelligence, and emergency response departments that were involved; elected officials; leadership of trauma and emergency departments at the hospitals which received the most seriously injured patients; corporate and non-profit sector executives directly involved in the events of that week; survivors and spectators who innocently found themselves caught in the tragedies of the week (see Appendix Three).

The intent here is not to judge any individual or agency as effective or ineffective. Rather, this analysis seeks to demonstrate where and how effective leadership emerged. The purpose is to extract general leadership lessons and thereby to inform preparations for and response to similar crises in the future. This analysis also places the experience of the Boston Marathon Bombing Response (MBR) in context with other crises which the NPLI has studied.

Response Leaders: A Strategy of Collaboration

This report focuses on leaders who affected the outcomes. Our definition of leadership is simple: "people follow you." This implies that getting people to follow is more than a matter of

rank alone. Many did lead with the authority of their rank and position. Others exerted influence well beyond their authority, taking quick decisions with immediate life-and-death implications.

Boston leaders have long regarded regularly occurring public events such as the July 4th celebration, First Night, and the annual Boston Marathon as opportunities to improve emergency response operations.

On the whole, what these leaders accomplished together was nothing less than astounding. Though three people were killed instantly, there were no fatalities among those who survived the initial blasts. Many of those with serious injuries were saved as a result of the speed and effectiveness of the responders. The alleged perpetrators succeeded in keeping their pre-attack plans and preparations secret, evading the intricate intelligence apparatus intended to spot and stop terrorists before they strike. Nevertheless, thanks to an aggressive investigation that recruited the public in finding and apprehending the suspects, the two were caught and the incident was brought to its conclusion in just 102 hours. And despite the intense impact on the community, the "Boston Strong" theme that emerged from those days affords a marvelous exemplar of the meaning of population resilience.

The focus on leaders and leadership directs attention to those people who set the direction and tone of the response: their decisions, actions, and communications. This report is not about operational aspects of the response: numerous other efforts have examined both successes and shortcomings. By contrast, this study focuses on the people and leadership questions: the relationships, connectivity of action, and unity of mission that were forged. Why were these leaders able to accomplish so much, so effectively, and so quickly?

The relationships among many of these leaders were built on a foundation of collaboration, a feature of the Boston emergency response community since well before it hosted the 2004 Democratic National Convention. That experience, so soon after 9/11, compelled local connectivity and bred the quality of solidarity in evidence during the Marathon response. In addition, there was active participation in cross-agency organizations such as the Metro Boston Homeland Security Region and the North Eastern Massachusetts Law Enforcement Council

among many other such associations. Boston leaders have long regarded regularly occurring public events such as the July 4th celebration, First Night, and the annual Boston Marathon as opportunities to improve emergency response operations. These linkages helped forge the cooperative ties and build awareness that major incidents do not respect jurisdictional boundaries. These people knew and trusted one another.

During the Marathon bombing response, they together faced wrenching choices. One example: there was fear in the moments after those two initial blasts that the perpetrators had more bombs (a theory confirmed days later when the suspects used another pressure cooker bomb and pipe bombs in Watertown). Nevertheless, in the immediate aftermath of the Monday blasts, leaders had to decide what to do with the tens of thousands of runners and spectators crowding Boston, many of whom used the public transportation system to get into town. Should public transit be open or closed? Which option created a more vulnerable target? Similarly, with a dangerous fugitive on the loose, they again had to decide whether to keep the public transportation system open that Friday. Could public transport be used to escape? Was a larger terrorist cell operating in Boston – one that could target crowded buses and? What to do?

Among the participants at the NPLI/MBHSR symposium in April 2014 were (from left): Dr. Leonard Marcus, NPLI; Rich Serino, FEMA (ret); Juliette Kayyem, Harvard Kennedy School of Government; William Evans, Boston Police Department; Alan Snow, Boston Properties; and Steve Ricciardi, U.S. Secret Service (ret).

Shaping the Response: "Swarm Intelligence"

In the course of this research, NPLI faculty discovered an unusual phenomenon among leaders of the Boston Marathon Bombings Response (Boston MBR). Though many people took charge of aspects of the response, no one was in charge of the overall event. Beyond that, these leaders set a tone of remarkable collaboration and inter-agency leveraging among one another. Competitiveness, ego driven behavior, and selfish credit taking – which are often present in large

complex crises that involve many different jurisdictions and organizations – were not significant factors in this event.

There certainly were people who took charge of specific aspects of the response:

- The Boston FBI Special Agent in Charge led the investigation;
- With Boston Mayor Thomas Menino hospitalized and then wheelchair bound (though often present despite his medical condition), Massachusetts Governor Deval Patrick assumed primary visibility of the political and public confidence building aspects of the event. Clearly focused on how he could effectively and helpfully assert the public authority of his office, Patrick was careful to avoid intrusion into operational decisions: he was there to support and not direct agency leaders;

Speedy relief: The One Fund was established in a day. It raised and distributed $60 million within 60 days of the bombings.

- The Mayor's Chief of Staff, recognizing the danger of many different organizations setting up competing funds to accept the outpouring of donations, took the lead with the Mayor's support to set up one fund, appropriately named the "One Fund:" $60 million dollars were raised and within 60 days the funds were distributed to the families of those who perished and to those with injuries, much faster than was found in other incidents such as the Newtown, CT shootings;
- Leaders of law enforcement agencies, through their unified command protocols, demonstrated extraordinary cooperation, working across multiple local jurisdictions – Boston, Cambridge and Watertown to name a few – and in concert with the Massachusetts State Police, the MBTA Transit Police and the Massachusetts National Guard along with federal agencies, including the FBI, Secret Service, and the Bureau of Alcohol, Tobacco, Firearms and Explosives;

- Those responsible for emergency medical services – from the site of the blasts to the near perfectly even distribution of patients across the Boston hospitals, to the quick hospital admission and transfer to trauma care – succeeded in orchestrating a near seamless and flexible performance that saved both lives and limbs.

Swarm Intelligence in Brief:

- ✓ Based on observation of the natural world where complex outcomes derive from the actions of "simple" individuals
- ✓ No one is in charge yet decisions are made for the benefit of the whole including dynamic allocation of labor, evaluation of data input, and choosing among multiple options
- ✓ Individuals follow social cues and simple rules to coordinate complex activity
- ✓ Violation of one rule can cause the collapse of beneficial swarming

The understanding of swarm intelligence in human systems is still in its early stages.

In our research of these leaders, we discovered a phenomenon akin to what is called *swarm intelligence* (SI), a relatively new discipline launched in 1989[i]. SI researchers study phenomenon in nature where complex behavior is achieved where no one is in charge or directing overall activity. Much of the SI work to date has focused on ants, termites, fish, and birds. The field is now turning its attention to artificial intelligence and robotics. Recently, human activity has begun to be examined from the SI perspective.[ii]

Scientists discovered that certain conditions must be in place for SI to occur: All involved must follow the same functional principles and rules.[iii] Individuals carefully observe and respond to one another, receiving and sending social cues and predictably reacting to them. It is through these social cues that they develop situational awareness, able to discern what is happening and what they each need to do next. Each actor individually directs his behaviors, actions, and decisions in relation to what is going on and to what needs to happen next. With some species, tasks are dynamically allocated. There is remarkably neither a commander nor a master engineer controlling what the outcome will be; individuals operate in concert and achieve something together – both order and outcome – which they never would have been able to accomplish on their own.

Through our interviews and observations of the Boston MBR leaders – some of whom we knew before as students or participants in NPLI educational programs – many of these phenomena were in play: order without control; situational awareness through both direct

communication and cues; and complex achievement through reliable coordination. We have been on-scene and active in many prior national crises and never before observed this degree of cross-agency and cross-community collaboration.

Foundations of Swarm Intelligence

The leadership functional principles and rules are quite simple. While these principles and imperatives may appear logical and self-evident, adherence is remarkably difficult during a high stakes crisis with its penetrating emotions and uncertainties:

1) An overriding objective that forges unity of mission and connectivity of action; is compelling enough to override standard practices as needed; and obviates bureaucratic obstructions, distractions, or bickering.

2) A spirit of generosity that rallies groups and individuals to assist one another and overcome constraints of resources, know-how, or tools to achieve the paramount mission, expressed as “Whaddya got? Whaddaya need?”

3) Respect for the responsibilities and authorities of others, described as "staying in one's lane" while assisting others to succeed in their lane to accomplish mission critical duties and tasks.

4) Neither taking undue credit nor pointing blame among key players, oftentimes portrayed as "checking your ego at the door."

5) Genuine inter-personal trust and respect developed well before the event so that existing and dependable leadership relationships, integrity and camaraderie can be leveraged during the event, often described as "don't wait for an emergency to exchange business cards."

We discovered an extraordinary though unspoken (and unconscious) compliance to these principles among the Boston MBR leaders we studied. This allowed them to leverage the benefits of SI. More often than not, large scale crises exhibit: bickering among political leaders; pre-existing rivalries among agencies that frame decisions, actions, and communications; and cross-jurisdictional conflict about who is in charge of what, blame, credit grabbing, and as a result, disruptive fragmenting of effort.

Following the Rules of Swarm Intelligence – Or Not!

Based on our prior on-scene field research and interviews with leaders of major responses, these rules and principles are regularly violated. For example:

- In the 2005 Hurricane Katrina response, there was little unity of mission, sharing of assets, jurisdictional clarity, blame avoidance, or camaraderie among key leaders;
- During the 2010 Deep Water Horizon Gulf Oil Spill, governors bickered and competed with one another, protective boom was hoarded, there were conflicts of jurisdictional authority between federal, state, local and business interests, and there was abundant blaming with a paucity of trust: this all despite formidable efforts by the appointed National Incident Commander to reign in the discord.
- We observed better adherence during the early 2009 H1N1 response, perhaps because many agencies naturally deferred to the Centers for Disease Control and Prevention given the nature of the threat;
- When Hurricane Sandy hit New Jersey and New York, SI was observed though it varied by geographic location and jurisdiction. In some areas, innovative efforts that built agency and community cohesion sprouted through grass root efforts, at times with formal sector support, whereas in other areas, people and agencies faced an isolation that only compounded the effects of the super storm;
- There was likewise adherence to SI principles during the 2012 shootings at the Sikh Temple in Oak Creek, Wisconsin though it took some time to develop.

What Defeats Swarm Intelligence?

In past incidents studied, NPLI researchers have observed several behaviors that counteract any tendency toward swarming:

- ✓ Political concerns and considerations overriding operational imperatives
- ✓ Historical rivalries between organizations or jurisdictions
- ✓ An appetite for media attention by one or two officials at the expense of others
- ✓ Lack of familiarity among leaders
- ✓ Failure to coalesce around an overarching mission

Though we were not present on scene during the 2011 tornado response in Joplin, Missouri, we learned from subsequent interviews with both government and community leaders

that during the response, there was close conformity with the conventions of SI. Leaders forged community coherence and resilience; they rallied efforts to reopen their damaged high school; local officials worked together with federal and state leaders, encouraging mutual support and assistance; and given the local nature of the event, old relationships thrived and new ones emerged.

What Happened in Boston?

What occurred in Boston to foster this SI, what conditions sustained it through the week, and what were the consequences? How did the rules and overriding principles of SI guide these leaders? Most important, how can this phenomenon be taught and animated so that it becomes a feature of future large scale responses? We answer these questions in light of the five SI principles and rules outlined above.

Unity of Mission: Save Lives

The first leadership principle, unity of mission, was simple: "save lives." This could be a challenging premise to follow because it often required breaking other rules. For example, when there simply were not enough ambulances to evacuate the critically injured from Boylston Street to hospitals, a Boston Police Department leader broke a rigid protocol that forbids transporting injured people in police vehicles. The same impulse guided investigators rushing to find and apprehend the suspects. More people could be killed if the perpetrators were not caught before they detonated additional explosives. Hence, the decision was made to release unclear images of the perpetrators in order to enlist the public's help in identifying and apprehending them.

Col. Tim Alben, Superintendent of the Massachusetts State Police, shares insights from the bombing response at the NPLI/MBHSR symposium in April 2014.

"Saving lives" in the face of an unknown set of risks and a devastating range of serious injuries became the overarching theme that shaped unity of mission among the many leaders involved, a principle that for example was missing in the post-Katrina floods in New Orleans.

The decision to keep the public transportation system open that Monday, despite the obvious risks, was abetted by the connectivity of action that emerged across the responding agencies.

Generosity of Spirit and Action: Whaddya got? Whaddya need?

The second leadership imperative, the generosity of spirit and action, was spoken colloquially as "Whaddya got? Whaddaya need?" An extraordinary level of cooperation developed across government agencies, private businesses, and non-profit agencies and among private citizens. Businesses close to the site of the bombings provided video from security cameras.

By Tuesday, investigators were able to watch the perpetrators carry the bomb laden backpacks to Boylston Street, drop their bags, call one another, and then walk away just before the parcels exploded. The Westin Hotel, just blocks away, made its function space available as a command center. The Lenox Hotel on Boylston Street was in the center of the crime scene. They opened the hotel to the army of investigators, providing lodging, food and a home base to those assigned to the investigation.

When President Obama visited Boston on Thursday, April 18, bomb sniffing dogs were required to secure the areas that he and the First Lady visited. Law enforcement and military agencies from around the country dispatched dogs and their handlers to assist in the massive operation.

The principles of Swarm Intelligence demonstrated in Boston were:

- ✓ Unity of Mission
- ✓ Generosity of Spirit and Action
- ✓ Stay in Lanes
- ✓ No Ego-No Blame
- ✓ A Foundation of Trusted Relationships

This didn't materialize out of thin air; Boston-area leaders had been building cross-organization relationships for more than a decade.

In the early hours of Friday morning, well over a thousand police units responded to the call for help in Watertown. A massive search was organized to find the fugitive suspect. Flashlights were in short supply. The manager of the Watertown Target store was in the midst of his annual audit when the sounds of gunfire and explosions were heard. Suddenly, law officers in full tactical gear appeared at his door in need of flashlights for the night time search. The Target manager emptied his supply of flashlights, and did so over and over again when there was a call

for cell phone batteries, food, and other logistical supplies. This spirit of generosity was seen between government agencies and in numerous public-private partnerships that were leveraged and developed over the week.

Respect for Lanes: I'll Stay in Mine; You Stay in Yours

The third leadership principle was respect for the authority, responsibility and bounds of each other's agency, jurisdiction and duty. And with that respect assured, extraordinary cooperation was forged across organizational lines of authority.

For example, the Posse Comitatus Act of 1878 prohibits the use of U.S. military forces to perform the tasks of civilian law enforcement, to include arrest, apprehension, interrogation and detention. It is a matter of both law and tradition and it has many local officials reluctant to authorize uniformed troops to operate in their jurisdictions. Sensitive to this, the Adjutant General of the Massachusetts National Guard suggested that in order to enhance the safety and confidence of the public in the immediate aftermath of the bombings, uniformed National Guard troops would be assigned to operate under the command and jurisdiction of a Boston Police officer in a three-to-one ratio. This created a force multiplier on the ground while respecting the jurisdictional authority of Boston. It was that combination that allowed leaders – with both concern and confidence – to keep public transit open on Monday after the bombings.

Similarly, the Chief of the Watertown Police Department, with just 65 officers on his force, suddenly found more than a thousand officers from countless other departments responding to the Friday shootout in his town. He quickly transformed his command posture to collaborate with the army of police and military agencies that overwhelmed his streets.

Tom Grilk, CEO of the Boston Athletic Association which is in charge of the Marathon, told us that in the immediate aftermath of the bombings, he asked himself what he was to do. He concluded that Boston Emergency Medical Services was doing its job caring for the injured. The Boston Police were on top of law enforcement. What was his job? It was to take care of the Marathon runners. Grilk coordinated with race director Dave McGillvray and race volunteers, none of whom were required to keep working after the race was suspended, but who did so for many hours to reunite runners with their personal belongings and cell phones. And that is what Grilk and McGillvray did, confident that everyone else likewise was doing their job.

No Ego – No Blame: Sharing Credit and Accountability

The fourth leadership rule was: no one grabs credit; no one shoots blame. Egos were kept in check. When the podium was taken for a press conference, a careful orchestration of leading figures stood before the cameras. There was a minimum of grandstanding. The week was not perfect but there were no glaring missteps. The media kept the focus on survivors, the evolving investigation, and the stories of those who witnessed or were impacted by the Boylston Street carnage. There is usually a lapse of time before the media finds its heroes and villains: the heroes typically being those who were negatively impacted by government actions and the villains being the government leaders tagged as responsible. The week moved too quickly for this phenomenon to occur. The mood was "we're all in this together," so the potential distractions of back stabbing and criticisms were absent. No one leader tried to outshine the others. It would have crushed the character of the response.

Trust: The Foundation of Collaborative Relationships

The fifth leadership was to leverage the strong inter-personal relationships, trust, respect, and camaraderie that were in place well before the Boston MBR. Many of these leaders spent their careers together, advanced side by side, and had deep respect for the professional expertise and credibility of their colleagues. For local residents, it was a rarity to see televised pictures of Boston Police in Watertown: law enforcement in New England keeps to their side of the town line. But that force was welcomed by the Chief of the Watertown Police who commented on how he knew the Boston Police Commissioner since early in their careers and was therefore not only accepting of and in coordination with the large Boston Police presence on his streets, he deeply appreciated it.

John Tello of Boston Properties (left) and Brian Correia of Target Corporation participated in a discussion on public-private partnerships at the April symposium

Of course, in an operation of this magnitude, nothing is perfect. In the effort to save lives, there were reports of frictions between police, fire and emergency medical services getting in one another's way on the day of the bombings. However, the scene of the Boston Fire

Department assisting in the investigation – hoisting investigators to the top of buildings in the search for evidence – ultimately demonstrated a picture of extraordinary collaboration.

Success Breeds Success: The SI Feedback Loop

Perhaps the most important finding on SI: its successes breed more success; it is self-reinforcing. It took several hours for leaders to reach collaboration on Monday, April 15 after the blasts, but once achieved, they discovered the advantages of being together and exchanging cross-organizational cues. These leaders got better at working together as the week wore on. By the time they reached the second event of the week – the shoot-out and manhunt in densely residential Watertown – they were quicker to establish their cross and multi-jurisdictional joint command. And at the Fourth of July Independence Day celebrations, these leaders established a framework – a table in the corner of the Joint Operations Center – where they could lead, guide, and coordinate, depending on whatever occurred. The conditions that encourage Swarm Intelligence can be planned for and leveraged as a deliberate force during a crisis.

Is SI the same as teamwork? There are important differences. Teams are intentionally structured with specifically assigned roles and tasks, an authority structure, and pre-set rules. It is closer to the skill that has been called "teaming" – the ability to rapidly form and dissolve teams to solve problems as needed.[iv] The Incident Command System, ICS[v], could be likened to a team effort. SI during a crisis differs because the

The Benefits of Strong Public-Private Relationships

A highlight of the response was the coordination and collaboration between public and private entities throughout the week:

Target has long fostered relationships with local law enforcement. Their Watertown store had participated in programs for at-risk youth through which store managers had come to know members of the Boston Police Department. The night that the manhunt began, those individuals were able to connect, allowing the police to receive immediate logistical support from the retailer in the form of flashlights, batteries, cell phone chargers and the like.

Boston Properties has been at the forefront of fostering public-private cooperation on public safety issues for more than two decades. That deep understanding helped Boston Properties tend to its tenants and shoppers effectively and efficiently in the immediate aftermath of the bombings. Later, video from their properties were valuable as police sought to identify the suspects.

Throughout the city, organizations were able to link and leverage across sector boundaries to meet the needs of various stakeholders.

defined boundaries of jurisdictions and responsibilities must adapt to the crisis as it evolves. In the ideal, ICS combines with SI. ICS is management while SI is leadership. In a massive, unprecedented event such as the Boston MBR, there is a critical interface between agencies working together without a script, functioning at the interface of emergency systems and political systems, and in response to unprecedented and volatile circumstances. It is the combination of ICS operations and SI leadership that provides the most advantageous leverage during a large complex crisis.

Whereas SI describes how the leaders worked together, how can we understand the individual thinking and actions of leaders during that week?

Analyzing Leadership: Meta-Leadership and the POP-DOC Loop

Based on extensive field research, the NPLI has developed strategies to assist leaders in times of crisis. Detailed descriptions can be found in the Appendix. These strategies are both descriptive, in that they seek to describe best practices, as well as normative, as they are both teachable and learnable.

Meta-Leadership[vi] describes the wide template of factors which the crisis leader monitors. There is: **The Person**, which includes the confidence that derives from experience, emotional intelligence, and the neuroscience of crisis response; **The Situation**, referencing what is happening, what is known about it, and what must be done, all in the framework of a "meta" far reaching and integrative perspective; and **Connectivity**, linking and leveraging people down and up the chain of command as well as across to other departments, organizations, and the community.

The ***POP-DOC Loop*** is a tool to set direction and guide action through a crisis. It is an extension and adaptation of the OODA Loop[vii] – observe, orient, decide, act – used by the military. This variant is more explicit about the distinct cognitive processes necessary for leadership in complex situations.

The POP-DOC Loop points the leader to: **Perceive** as best as possible what is happening, recognizing that much is unknown or unknowable; **Orient** that information into patterns that, as best as possible, can be detected and understood ; **Predict** what is likely to

happen next based on the projection of those patterns going forward; **Decide** building upon what is known about those patterns and in keeping with desired outcomes; **Operationalize** those decisions, taking action, coping with risk, and testing the prudence of the course taken; and **Communicate**, which sets the flow of information going out to inform others as well as information coming in which can be used to start the process over again. Once through a POP-DOC Loop, the Meta-Leader re-starts the pathway, perceiving the impact of what was done, orienting to new patterns, predicting how the changes will manifest, reaching new decisions, operationalizing an adjusted course of action, and then communicating new directives and outcomes.

Insight on The Person of the Meta-Leader: Emotional Intelligence

Daniel Goleman's work on emotional intelligence (EI) is central to effective leadership. Goleman identified five elements of EI:

- ✓ Self-Awareness: How are you perceived by others?
- ✓ Self-Regulation: Are you in control of your emotions?
- ✓ Empathy: Can you sense and feel the emotions of others?
- ✓ Motivation: Do you understand what motivates you and others?
- ✓ Social Skills: Are you comfortable with others and can you make them comfortable with you?

High EI is not a matter of being an introvert or extrovert. One's EI can be developed with persistence and attention.

See *Emotional Intelligence: Why It Matters More than IQ*, Bantam Books

Meta-Leadership and POP-DOC during the Boston MBR

The Person: Leaders often reported a sense of shock when they heard – or heard about – the first explosion. Some form of "Oh sh!t!" was a common expletive. Those on scene who heard the initial blast generally perceived it as an accident of some sort, perhaps a tragic but manageable malfunctioning of a propane tank. With the second explosion, they realized this was a terrorist incident. The brain has a natural alarm system, the amygdala, which prompts an instant descent to the defensive hindbrain – the freeze, flight, fight response – what is often referred to as the "amygdala hijack" or "going to the basement."

How did these people ascend up and out of the basement? After a moment of shock, the leaders we interviewed reported a quick burst of resilience. There was personal confidence: "I can do it" and "I'm it!" Then there was system confidence: "We can do it" and "We're it!" They recalled drills and exercises that rehearsed the response to just such an IED. Some told us they thought of the

"Mumbai" incident, others referenced "the London bombings." No matter the reference point or its degree of correlation, the combined personal confidence and system confidence drove them forward: "We know how to respond. We can do this." They assumed their leadership posture with the confidence of experience.

Then Boston Police Superintendent Billy Evans had just run the Marathon and was relaxing in a hot tub when word of the bombings reached him. He was alerted by a phone call. He described a quick moment of freeze and then he was up and on his way to Boylston Street. Five days later, it was Evans who led the operation to arrest Dzhokhar Tsarnaev. By chance, he was close by when Watertown resident David Henneberry reported that the wrapping was torn on the boat in his backyard, there was blood on the outside, and someone inside. Evans took position near the boat as tired, emotional, and eager officers from many different law enforcement agencies lined up behind him. "There I was. The suspect was in front of me and one hundred guys were behind me, all with their guns pointed at my back. I went to the basement." Again with a palpable ascent, Evans was clear on his objective: get the suspect alive with no friendly fire injuries. Gunfire broke out and Evans screamed "Hold your fire!" Evans kept focus and soon thereafter, the suspect was apprehended. There were many bullets though no injuries.

The Governor's calm, which he maintained through the response… turned out to be an asset during the high stakes decisions and actions that would lie ahead.

The contrast to a typical emotional response was described by Massachusetts Governor Deval Patrick. Asked how he reacted when news first reached him, he said, "I get calm in a crisis." The Governor's calm, which he maintained through the response, was also described by other leaders of the response. It turned out to be an asset during the high stakes decisions and actions that would lie ahead.

Leaders who arrived on the scene of the bombings described an internal, personal, and emotional push and pull worthy of mention. Many had risen up the ranks, from emergency medical technician to head of Director of Boston Emergency Medical Services or from foot patrol officer to a leading rank in the Boston Police Department. Seeing the numerous and

serious injuries, there was a natural pull to become operational: to treat people or to become tactical and thereby, to lose the outlook and perspective of the leader.

In 2009, another "Tale of Our Cities" symposium was held in Boston[viii]. Representatives of cities which had suffered IED attacks – London, Madrid, Tel Aviv, Pakistan, and India – shared their experiences with 300 Boston emergency leaders and workers. The head of the Madrid Emergency Medical Services, "SAMUR," told of how – during the March 2004 train bombings – he reached the site of the second of what would be four separate blast locations. A physician himself, he instinctively started treating the injured. However, when word came of the third and fourth bombings, he was unable to provide the leadership necessary to direct the overall operation because he was so pre-occupied with operational tasks.

With that in mind, the Director of Boston EMS reported that same pull but recounted later, "I remained the leader." Another Boston Police leader reported arriving at the scene to find an eight year-old boy, seriously injured and dying. He told us "At that moment, I was a father." That instinct prevailed. He dropped to the ground and tried to resuscitate the boy. Moments later, a colleague tapped him on the shoulder and drew his attention to where the senior officials were gathering. In that moment, he regained his perspective. The lesson: during a crisis, it is critical to "Be the Leader."

The Situation: The first question was "What happened" or in the lingo of the event, "Whaddya got?" Beyond that, for leaders, the responsibility was to "Anticipate" and then lead and guide ahead. The premise again: Be the Leader. The key question was what could happen next and what to do about it. On the Monday

Making Decisions in the Midst of Crisis: The Colin Powell Rule

The remarkable dynamic through the event was the paucity of information which the leaders had in the moment and the gravity of decisions which they nevertheless were able to reach.

General Colin Powell famously described the 40-70 rule[1]: Once the information gives you a 40-70% probability of being right, go with your gut. Don't take action if you have only enough information to give you less than a 40 percent chance of being right, but don't wait until you have enough facts to be 100 percent sure, because by then it is almost always too late.

Excessive delays in the name of information-gathering breeds "analysis paralysis." Procrastination in the name of reducing risk actually increases risk.

of the bombings, that meant the possibility of more explosive devices. Next, commence the investigation. On Friday, that again meant more people and more bombings. An extensive manhunt was mounted to track down the perpetrator, or perpetrators. There could be a much larger terrorist cell at work. Decisions had to be made.

In our research, we applied the POP-DOC Loop to analyze the steps leaders followed in building situational awareness and anticipating the decisions and actions that lie ahead. The POP Loop – Perceive, Orient, Predict – described their aggressive assessments and the DOC Loop – Decide, Operationalize, and Communicate – described the massive organizational effort that was mobilized over those five days.

> "There we were on Boylston Street. There could be more bombs. We could have all been blown up right there."

Perceive: It may seem easy to perceive: open one's eyes and look. In fact, this starting point is particularly complex during a crisis and especially a terrorist attack when so little is known about the perpetrators, their motives, and their next steps. There are numerous distractions: emotions, the intensive attention on the crisis, including the media, and peripheral activity which may or may not be related to the crisis itself. While some facts can quickly be known, much of what is important is unknown and perhaps even unknowable at the outset. It is difficult to sift through a surge of new information, some of which may be correct and some of which is speculation and incorrect.

Perceiving turned out to be a story of "Location, location, location." Location is not often associated with the study of crisis leadership. The Monday Marathon bombings and the Friday manhunt provide evidence that it is a critical factor. At first the location question was, "*Where am I now?*" in relation to the crisis. Then thinking about location shifted to, *"Where do I need to be?"* In most cases on both days, leaders quickly moved to get closer to the actual event. It was helpful to experience the scene of the incident as part of their information gathering and sense making. Finally, leaders asked, *"Where should I establish a base?"*

On Monday, this seemed to arise both from the realization that there could be additional bombs in the Boylston Street area and from the necessity to quickly establish a command center. As the Director of the Massachusetts Emergency Management Agency told us, "There we were

on Boylston Street. There could be more bombs. We could have all been blown up right there. So we started moving toward the Westin Hotel. We didn't stop at the front desk. We moved straight to the ballroom floor and started setting up our command center."

Describing the initial response to Friday morning's violence in Watertown, several interviewees used the term "chaos": none had used that word to describe Monday despite the carnage and confusion. There were hundreds of police on scene in the aftermath of the shootings. Many arrived, took their keys out of the cruiser and ran toward the action, rendering the neighborhood into a parking lot of police cars. An officer was down. The fugitive escaped. There was seething emotion.

In the effort to restore order, Boston Police Superintendent-in-Chief Daniel Linskey got on top of a cruiser and shouted out, "If you don't have orders to be here, get yourself to the Mall parking lot." Linskey perceived the chaos, inserted command and control, and with that, restored a measure of order by moving to a more manageable location. Shortly thereafter, the State Police command truck arrived and was set up close by in the Watertown Mall parking lot. Leaders conferred in the command truck. That unit was surrounded by separate agency operational mobile command vehicles. In both cases, leaders achieved their perspective close to but not at the sites of the incidents.

Perceiving is also affected by cognitive biases which focus attention on what one expects to see. A range of biases can cloud perceiving. When the bombs hit, one of our research team was in Washington, D.C. meeting with national security and counter-terrorism leaders. Washington quickly jumped to the conclusion that this was a domestic act of terrorism: it was Patriot's day, tax day, and the anniversary of the violent Waco, Texas Branch Davidian siege. Ultimately, none of these factors explained what happened in Boston. By contrast, local leaders leaned toward an international threat. At the time, they did not know if the bombings were an isolated incident or part of a much larger scheme and network of activity. The more accurate and perceptive the observations on a wide range of activity, the better would they be able to turn chaos into order. Abundant curiosity is a critical counter-balance to cognitive biases and group think.

Orient: The crisis leader orders what has been perceived into patterns that explain what is happening. Can one distinguish the progression of events that led to the crisis? Is there a logical explanation, stimulus-response sequences, which can be grasped amidst the calamitous series of

events? In the first minutes following the blasts, leaders struggled to understand what happened. Once they recognized that this likely was an intentional attack using improvised explosive devices, new facts fit into their broader understanding of just what was occurring. Under these circumstances, coincidence can be distracting. By chance, a small fire broke out at the John F. Kennedy Presidential Library shortly after the initial explosions. Though unrelated, it raised suspicions that a much larger attack was underway.

In addition to interviews, we reviewed videos of the reaction of the crowds watching the Marathon near the finish line explosions. Many who saw or heard the explosions immediately started running away. When those in a nearby shopping arcade saw the mass of people racing into the entrance, they too started running, though with seeming little idea of why or of where they should go.

The quicker and the more accurate the pattern recognition, the better are crisis leaders able to transform the confusion of the event into a coordinated and effective response.

Predict: If one is able to accurately identify key patterns, and if there are stimuli that continue to prompt those patterns, it is possible to predict what likely will happen next. It is however extraordinarily difficult to discern those patterns and predict reliably during the sort of terrorist attack that occurred in Boston. The situation was volatile and dangerous with many unknowns. Counter-terrorism tactics rely upon the would-be attackers to communicate with others about their plans and intentions in order to catch them before they act. The longer the planning period, the greater the likelihood that they will be detected or that someone will hear about their intentions and alert officials.

The Boston Marathon suspects however were quick and they kept their conversations for the most part to themselves. They eluded the counter-terrorism system prior to their attack. The release of their yet unidentified pictures to the media on Thursday, April 18 after President Obama departed from his visit to Boston was a calculated effort to expose the suspects, either through identification by someone who knew them or through their own anxiety driven actions, having seen themselves publicized in the media. Within hours, they started a crime wave that quickly caught the attention of law enforcement officials and led to their capture and arrest. The

key responsibility of leadership is to anticipate what is likely to happen next and then to direct decisions and actions toward the intended outcomes.

Decide: If one could accurately predict what would happen next, all decisions would have the intended outcomes. However, the most effective crisis leaders know they work within those 40-70 percent parameters. While the release of pictures did prompt the suspects to come of hiding, tragically their crime wave started with the murder an MIT campus police officer, a carjacking, and in a quiet Watertown neighborhood, shootings and the detonation of another pressure cooker bomb and pipe bombs. The outcome certainly could have been even more deadly. According to media reports, the perpetrators allegedly told their carjacking victim that they intended to go New York City where their bombs would have created far greater carnage. Once leaders reach decisions, in particular during a volatile crisis, the situation itself changes rapidly.

One difficult decision can lead to the next difficult decision. Leaders anticipate what comes next and no matter how difficult the choices, they recognize that a non-decision by default is a decision.

During the Watertown confrontation, the older Tsarnaev brother, Tamerlin, was killed. The younger brother, Dzhokhar, escaped into the early morning darkness and was on the loose. There were difficult decisions to be made that morning. Where would the perimeter for the intensive manhunt be set? Should public transportation operate, should it just be closed in one section of the city, or should the whole city be closed? Reports of suspicious characters and activities from across Boston reached the command group. There was the danger that the suspect or suspects could use public transportation to escape or could set more bombs in crowded buses and trains. Minutes before the first buses were to roll, there was a decision to close the transit system. Residents within and adjacent to the search perimeter were told to shelter in place. And finally, all of Boston and the surrounding area were closed down. This was a first for the country.

At about 5:00 pm Friday, leaders found themselves at another decision point. Should the lockdown order be lifted even though the suspect or suspects were not found? There was little dissent. They assumed the suspect was no longer within the perimeter. Residents were told they

could leave their homes: the shelter in place order was lifted. One law enforcement official told us that he believed this crime eventually would be solved in cooperation with the public. As it turned out, he was right. With the shelter in place order lifted, the owner of a recreational boat went outside and noticed the protective wrap on his boat was ripped and blood stained. He alerted law enforcement who swarmed into his Watertown neighborhood and made the arrest.

One difficult decision can lead to the next difficult decision. Leaders anticipate what comes next and no matter how difficult the choices, they recognize that a non-decision by default is a decision. One hallmark of the Boston response is the rapid-fire pace of decisions that reached these leaders. Their determination to build consensus quickly galvanized those coordinated decisions into an overall strategy. The decision to release the photos of the suspects on Thursday afternoon of the event exemplified that sort of consensus building.

Operationalize: Decision-making and taking action are not the same[ix]. Operationalizing those decisions requires an understanding for what it takes to move systems and the consequences that will result. At times, the consequences are immediate. Often, it takes a long time to reap the outcomes.

Long before the Boston Marathon bombings, local emergency leaders worked diligently to prepare their departments for just such an event. Numerous training sessions, drills, and exercises rehearsed a mass casualty event on the scale of what occurred that day. In the instant after the bombings, a massive medical response had to be mounted amidst the carnage on Boylston Street. How does one best direct and organize activity under these circumstances?

Paramedics, medically trained volunteers, police officers, fire fighters and helpful citizens activated the triage system. Patients were distinguished by their need for treatment. The vast majority of the 260 people requiring medical attention were moderately injured and thanks to quick leadership and direction at the bombing sites, these people were taken to and treated at the medical tent set up near the Marathon finish line. As a result, those with life threatening wounds were loaded onto ambulances for immediate evacuation to trauma centers. Thanks to the direction of the Boston Emergency Medical Services dispatch center, there was an even distribution across the six level one trauma centers, those best able to handle patients with life

threatening injuries. These patients were admitted before the wave of less injured people arrived, allowing the hospitals to correctly allocate their attention and activity.

This one exemplar typified what we found across the response. The leaders we interviewed expressed enormous confidence in the other organizations and agencies that were part of the immediate effort. That confidence allowed them to do their job, with appropriate flexibility, knowing that the rest of the overall operation was being handled as well as it could. This confidence, what we earlier identified as Swarm Intelligence, was an essential factor in the decisions made, actions taken, and the overall successes of the response.

Communicate: We do not want to create the impression that everything occurring that week was without problem. There were a number of glitches and we often heard laments about communication as events unfolded. This is a common refrain during and after a crisis: "We could have done a lot better at communication."

In the case of the Boston Marathon response, there were two noteworthy problems. The first involved too much communication. On Friday morning as the shootout unfolded in Watertown, a police radio dispatcher ordered all law enforcement units in eastern Massachusetts to the scene. As the Watertown police chief related later, "I have 65 people on my force. All of a sudden, I had 1,800 police in my town. They didn't know where to go, what to do, and no one was in charge." When one shouts out "help," expect a response that has to be led and coordinated. Many of the people we interviewed described a scene of chaos on top of the crisis itself. As one law enforcement official described it, "We all looked like the Keystone Cops."

Just as there can be communication that is too wide and unlimited, there can be communication that is too sparse and infrequent. We heard this about the events of that long Friday when all of Boston was confined to their homes. Leaders did not have news to report and were therefore were reluctant to speak to the media. In the vacuum of course, rumor and misinformation spread. In retrospect, leaders told us that an hourly news briefing should have been held throughout the day, if for no other reason than to comfort and encourage the cooperation of the public. The public was anxious and their support was vital to the mission that day. More frequent communication could have had the added benefit of dampening speculation in the media, which has airtime to fill. In an always-on world, crisis leaders must both "surf" the

waves – the daily newspaper and the top-of-the-hour newscast – and "swim" the streams – the constant flow of information on-air and online. Crisis leaders communicate with a wide set of constituencies that reach far beyond their decision making tables. They lead down to their agencies, lead up to their bosses, and they lead across to the many other organizations and agencies that are a part of the response.

One of the more important communication innovations during the Boston MBR was the use of social media during the event. Twitter for example was for many people the original source of information about the explosions. In the spirit of "If you can't beat them, join them," the Boston Police Department kept open its Twitter feed and online access to its scanner communication to provide information on what was occurring in the moment. That gained them credibility with the public by keeping communication transparent. It was remarkable that news of the capture and identification of Dzhokhar Tsarnaev was not leaked to the press. The announcement reached the public and media simultaneously and accurately through a BPD Tweet.

Together, the meta-leadership dimensions of practice and the POP-DOC Loop focus the attention of those in charge, directing them to the who, the what, and the where the event is going. We asked many of these leaders "Who was in charge?" While the Boston FBI Special Agent in Charge led the investigation, we were told that no one was really in charge of the overall response. It was, by the descriptions of the many leaders involved in command decision-making, a truly collaborative effort. In this way, they were able to link and leverage what each of them brought to the table as well as what each needed to get in order to accomplish the shared mission. And it was that combination of missions and the operational ties – the Swarm Intelligence – that was the hallmark of the response's success.

Leading Connectivity[x]: There are many people to whom a leader must pay attention, both in routine times and in times of crisis. There are subordinates, *leading down*. Everyone has a boss, *leading up*. And there are many departments and organizations beyond the direct chain of command, *leading across*. The Swarm Intelligence that is described above became the glue that united the extraordinary connectivity of mission and jointness of effort that developed, though it took several hours to emerge. Eventually, it became the feature and overriding principle that

accounts for much of the connectivity that occurred following the Monday bombings in Boston. That SI grew further by the time these leaders faced the Friday confrontations in Watertown.

About one hour after the explosions, leaders and their senior staff began arriving at the Westin Hotel, located 2 city blocks from the sites of the blasts. For the first hour or two, it was a crowd of people, most in uniform, gathering in agency specific circles. Leaders immediately checked in with their team or silo – "leading down" – to ensure that their reports were OK, that they were responding effectively and to gather frontline intelligence. They also contacted their hierarchical superiors both to report what they knew and to seek more knowledge of the event. While they were in contact with their peers in other agencies, the focus initially was within their operational or jurisdictional silo. There is comfort in focusing upon and working within the confines of one's familiar agency: there is an unambiguous authority structure with clear rules and decision criteria. It is self-reinforcing. Had there not been a switch at this point, it is unlikely that Swarm Intelligence would have emerged. This is a critical lesson to capture for future crises. How did the switch occur and how can it be replicated in other events?

First, there was the realization that this event was bigger than one agency alone. The State Police for example could not handle this event independently – they had neither the authority nor the assets. Likewise, the FBI could direct the investigation but what was happening was bigger than an investigation alone. Though the bombings occurred in Boston, the Marathon is a metropolitan event and numerous jurisdictions were already on alert.

Connectivity: The Trust Equation

David Meister, Charles Green, and Robert Galford developed an equation to describe how trust is defined and displayed. We have adapted it slightly here:

$$\frac{C+R+I}{S}$$

C= Credibility – Can you do the job?

R= Reliability – Can you be counted on to do the job?

I= Intimacy – Are you open to and adept at forming relationships?

S= Self-centeredness – Are you out more for yourself or the collective good?

Thus the greater the numerator – the sum of C+R+I – and the lower the denominator – self-centeredness, the more trustworthy one will be.

See *The Trusted Advisor*, Touchstone Books

Second, there was the realization that given the scale of what occurred, this was a political event that required involvement by elected leaders. Momentous and risky decisions were to be made. The public would have to be reassured: enough to feel confident that everything was being done to ensure community safety. The response furthermore would require the cooperation of the public. For all those reasons, the face of a calm elected leader would be necessary. Many agencies would have to work together and an involved, fair, elected official could set the tone, provide the authority, and foster the cohesion necessary to advance in a coordinated manner.

…the cohesion seen was not inevitable. It was assembled by those in the lead.

Boston Mayor Menino was hospitalized in a post-surgical unit at Brigham and Women's Hospital and was unable to move in those first hours. Governor Deval Patrick was at his home in Milton when the explosions occurred. His security detail picked him up and insisted – based on concerns for his safety – that he locate at the State House, about a mile from the explosions. However, leads of the responding agencies persuaded him of the importance of his being on scene at the hastily set up Westin Hotel command center. And that is where he went.

In our research on crisis leadership, we have found naturally occurring entropy at the outset of a crisis. The chaos of the event turns whatever organizational order may exist, or that was planned, into turmoil. The adage that "No battle plan survives contact with the enemy[xi]" still holds true. Leaders naturally want to assert control when the incident itself robs them of it. Distractions, like bright lights, divert their attention to what is knowable or understandable. Once sidetracked, they lose sight of the bigger picture. The anxiety fosters accusatory behaviors. Each leader wants to be the hero – bearing the easy solution – and they often seek easy targets as villains. Leaders become concerned for their future: could this be their political downfall? Agency leaders wonder: might they lose their job? The mounting competitive tenor clouds the possibility of collaboration.

We will never know all the reasons why this did not happen during the Boston Marathon Bombings Response. What did occur – the Swarm Intelligence – was so self-evident and powerful for those present that they could barely imagine an alternative. Nevertheless, it bears mention that the cohesion seen was not inevitable. It was assembled by those in the lead.

Several factors were critical, having heard the same narrative from numerous people. First, Governor Patrick described his first action at the Westin as "making sure the right people were talking to each other." He then entered the conversation with a question, "How can I help?" At that point, he was six years into his leadership of the Commonwealth. He had experienced many crises. He had confidence in his emergency management team as well as a sense for how he, as an elected official without subject matter expertise, could be of greatest assistance. In leading down, he was there to support their expert assessment of what was happening and what needed to be done about it.

As a former federal prosecutor, he knew that someone had to be in charge of the investigation. After informally polling the agency leaders present, the consensus in the room was for the FBI to take the lead. He slowly went around the room locking eyes with each person, asking "Are you OK with that?" and waiting for a verbal "Yes." He then encouraged a spirit of collaboration around the room and let his operational leaders take it from there. They began leading across. National Guard troops were assigned to Boston Police in order to enhance the local security presence. Communications with Washington alerted federal officials to the assets that would be needed by local and state agencies. Decisions and declarations were to be made. The tone was set: this leadership group would work together. The character of the response was set to encourage Swarm Intelligence.

Rene Fielding, Director of the Mayor's Office of Emergency Preparedness for the City of Boston, discusses her perspective on the Marathon bombing response at the NPLI/MBHSR symposium in April 2014.

Remarkably, we found similar collaborative efforts, connectivity and SI in other venues as well. We gathered a city-wide representation of emergency department and trauma physician leaders that received patients with life threatening injuries. What they each described was extraordinary collaboration within their hospitals, strong enough to overcome the breakdown – in each of the major trauma centers – of the electronic medical record systems.

At the scene of the bombings, citizen volunteers, police and emergency medical personnel formed an army of "scoop and run" workers that first applied tourniquets to the worst injured and then speedily evacuated them from the dangerous scene. With 6,000 volunteers spread across the Marathon route, the Boston Athletic Association mounted an effort to communicate across the city, mobilizing volunteers to assist runners and their families. The City of Boston marshaled support and assistance to residents and businesses that were in the cordoned off crime zone.

Robust partnerships arose among non-profit organizations, such as the Red Cross, the business community and responding government agencies. Support was provided to those injured, their families and those who witnessed the blasts. Many were left traumatized by all they saw and an aggressive mental health support network emerged. Overall, the tone across the stunned city was one of cooperation, collaboration, and "How can I help?"

In the Watertown neighborhood where the intensive manhunt was concentrated, an operational glitch occurred: sufficient water, food, and sanitary facilities were not available to the massive number of those involved in the manhunt. How was the problem solved? Local residents and businesses took care of those at the front lines. And when officials asked people across Boston to shelter in place during the manhunt, the voluntary compliance was nothing less than extraordinary: City streets were empty.

Be ready for crisis leadership at any moment

One can barely predict when a crisis will hit. Boston Marathon planners were ready for a variety of adversities, including the many cases of heat stroke that struck during the hot weather of the prior year's run. Ever since 9/11, emergency response officials pondered and planned for the possibility of an "IED" terrorist attack against a large public gathering, including major sports and political events. Every one of the leaders we interviewed attested to the value of the planning and preparation that preceded the events of April 15-19, 2013. The Marathon itself is an exercise in individual resilience against the odds and it became emblematic of how the city itself would endure through the traumas of that week.

That readiness combined with an ample measure of good luck. The bombings occurred near the Marathon medical tent so there were people and supplies to treat the moderately injured. The tents were not crowded as cool weather minimized the incidence of heat exhaustion. The spectators had thinned after the elite runners passed the finish line nearly three hours before the blasts. The Marathon calls upon 6,000 volunteers many of whom were ready and eager to help when the task turned from welcoming the runners at the finish line to treating their wounds and reuniting exhausted runners with their belongings and distressed families. The bombings hit during a shift change at hospitals, so they all had ample clinicians to meet the surge of injuries.

It is also important to note: as traumatic as was this event, it was at a relatively small scale compared to other urban attacks, such as the 2004 Madrid attacks, the 2005 London attacks, and the 2008 Mumbai attacks. Had the perpetrators placed the bombs higher off the ground, in a more crowded location, or at an earlier time, the initial impact and the eventual outcome could have been very different.

The critical feature of the leadership of the Boston Marathon bombings response was Swarm Intelligence: the dedicated coordination of decision-making and action among city, state, and federal government agency leaders, elected officials, business leaders, philanthropists and the community. Together, leaders were able to effectively link and leverage what they knew, their assets and resources, and their operations in order save lives, apprehend the suspects, and encourage the resilience of the community. We found that leaders actually got better at all this as the week progressed. In other words, successes bred more successes. Massive Swarm Intelligence builds better SI. This is why Friday was better than Monday and the Fourth of July planning and operations were even better than what preceded.

What are the key crisis leadership lessons for senior officials and executives?

- Do not begin basic crisis leadership readiness and planning after the crisis hits. It is too late. Invest time and attention before a crisis to get yourself and your organization ready.
- While you cannot be prepared for every calamity, if you have the basic technical protocols and materials in place, and if you have mastered the human factors that will put them into action, you will have the agility and tenacity to meet and overcome what could hit you.

As a leader, how you handle yourself and others through a crisis could very well define your career. Why is this so? During a crisis, many people are watching. The media craves a crisis and as an identified leader, you are often at the epicenter of a combustible situation: the glare of an intense spotlight coupled with a magnifying glass of media attention and public concern. This is the “You’re It!” moment. Depending on the scope and scale of what happened, much is at stake. If you as leader lose the confidence of your constituents, you exhaust and deplete your most important asset. People stop believing in you.

Your operative question and your overall objective is resilience. Will you be able to get your people, operations, and business to bounce forward to achieve pre-crisis levels of function after you have been through a major disruption? If so, you create confidence and thereby, you create value for your constituents. No government agency or private company is immune from the potential that a surprise crisis will come your way. And therefore, no entity or its leadership can be unprepared to mount the unity of purpose and connectivity of action exemplified by those in the lead during the response to the Boston Marathon bombings.

-END-

All photographs from the NPLI/MBHSR Symposium taken by Tom Fitzsimmons—tom@fitzphoto.net

Appendix One

Select Leadership Timeline

These times and events represent closest possible approximations and were collected from interviews with those present, observations during the event and from numerous media accounts of that week.

Monday, April 15, 2013

9:00 -10:40 am Waves of runners depart from the Hopkinton, Ma Boston Marathon start line.

Noon	First runners approach the finish line on Boylston Street in downtown Boston
2:38 pm	Cameras show Tamerlin and Dzhokhar Tsarnaev walking on Boylston Street near the finish line and toward the blast sites.
2:49 pm	Two bomb blasts on Boylston Street: the first near the Finish Line and 12 seconds later and a city block away, a second bomb
2:54 pm	Boston trauma centers are alerted to prepare for the arrival of mass casualties from a bombing attack
3:08 pm	Casualties begin arriving at area hospitals
3:30 pm	A fire breaks out at the John F. Kennedy Library with suspicions that it is linked to the bombings on Boylston Street. It is coincidence.
4:30 pm	A command center is beginning to form at the Westin Hotel as agency leaders gather.
5:00 pm	The NHL cancels the Boston Bruins hockey game scheduled for that evening
6:10 pm	President Obama addresses the nation regarding the Boston Marathon Bombings
6:30 pm	The command group meets at the Westin Hotel.
8:00 pm	Responsibility for the investigation is formally given to the FBI

Tuesday, April 16, 2013

With announcement of the names of the deceased and approximate number of injured, a fuller picture of just what happened the day before emerges for the public.

An aggressive search is begun in the area of the bombing to collect evidence from the scene.

Investigators piece together video collected from security cameras where the bombings occurred: two men are observed leaving bags amidst the crowds at the blast sites.

The “One Fund” is established as a non-profit organization and is declared the sole official address for charitable contributions.

Wednesday, April 17, 2013

The aggressive investigation continues throughout the day as leaders are briefed on the videos and pictures of the bombings.

Noon	CNN reports and rumors spread that there has been an arrest in the case.
2:33 pm	The Boston Police Department tweets: "Despite reports to the contrary, there has not been an arrest in the Marathon attack.
7:35 pm	The Boston Bruins, having cancelled their Monday hockey game, hold the first major sporting event following the bombings.

Thursday, April 18, 2013

10:00 am	President Obama and the First Lady arrive in Boston to attend a service for Boston Marathon Bombings victims and survivors at the Cathedral of the Holy Cross, and then visit hospitals
	A robust discussion is held throughout the afternoon on whether to release blurry and unidentifiable pictures of the suspects. The decision is made to do so after The President leaves Boston.
5:20 pm	At a Sheraton Hotel press conference, the FBI releases blurry pictures of the suspects and asks the public's help in identifying and capturing them.
10:25 pm	MIT Police Officer Sean Collier is fatally shot on the Cambridge campus, allegedly by the Tsarnaev brothers.
11:00 pm	A young Chinese man is carjacked in Brighton allegedly by the Tsarnaev brothers. The three go to an ATM machine in Watertown and withdraw money from the victim's account.

Friday, April 19, 2013

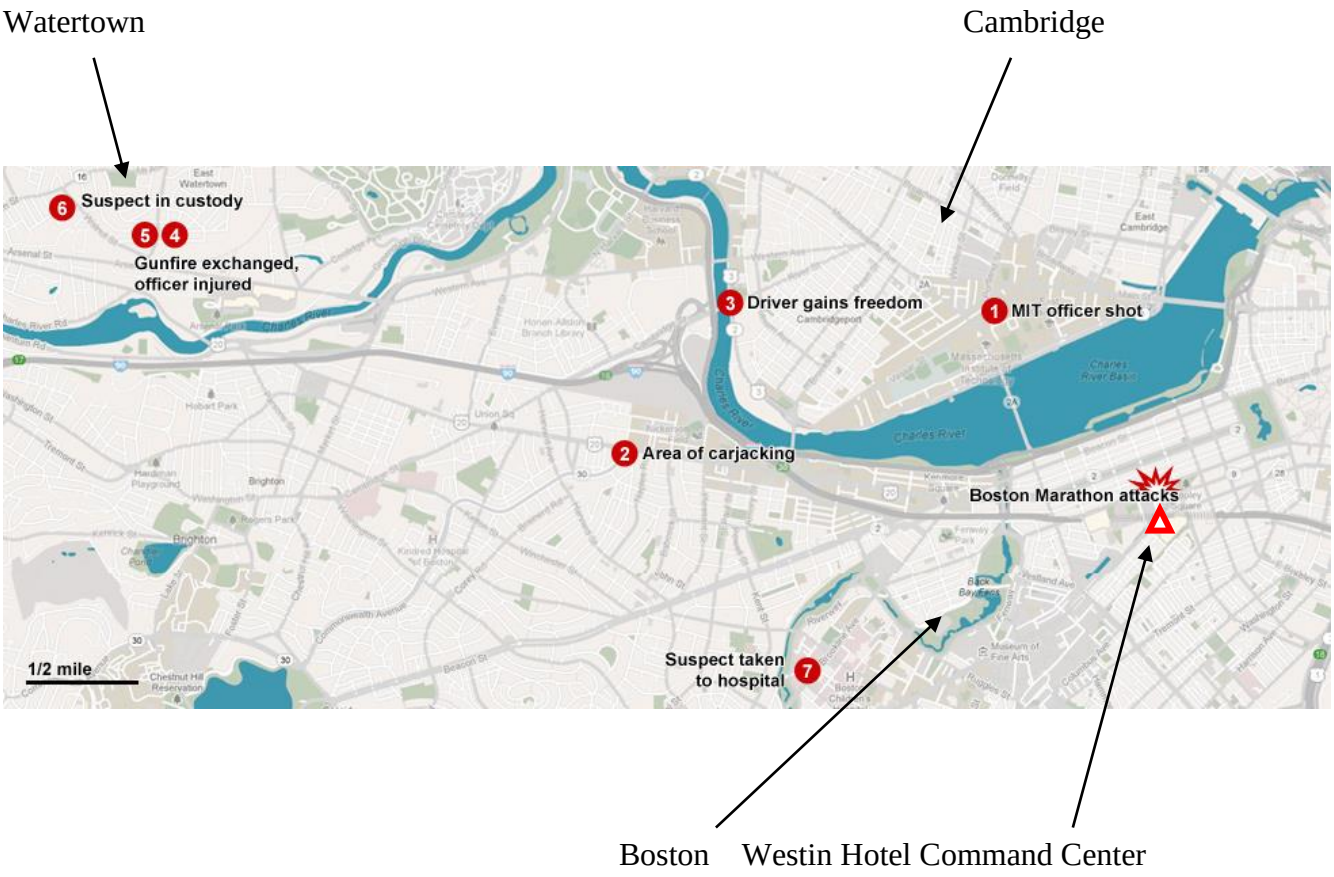
12:15 am	Carjacking victim escapes during a fuel stop, running from the Shell station to the Mobil Station on Memorial Drive in Cambridge
12:40 am	Police come upon what they first believe is a stolen car at Dexter and Laurel Streets in Watertown. A shoot-out begins and a pressure cooker bomb and pipe bombs are discharged in the ensuing battle. Tamerlin Tsarnaev is severely injured and transported from the scene by ambulance. Dzhokhar Tsarnaev escapes and is on the loose.
1:35 am	Tamerlin Tsarnaev is pronounced dead at Beth Israel Deaconess Hospital
2:00 am	Police at the scene of the shooting are directed to move to the Watertown Mall parking lot. Shortly thereafter, command vehicles arrive to the parking lot and a command center is established.
	A door-to-door search begins in the Watertown neighborhood near the shootings. Throughout the night, there are reports of suspicious persons in Watertown, Boston, and heading to a train leaving South Station, Boston
4:30 am	Residents of Watertown are asked to shelter in place as the pursuit for Dzhokhar Tsarnaev intensifies.
4:45 am	Minutes before buses and trains are ready to roll, a decision is made to close the Boston area mass transit system.

5:45 am	Residents of Watertown are asked to shelter in place as the pursuit for Dzhokhar Tsarnaev intensifies.
8:00 am	Residents of surrounding areas, including Boston and Brookline, are asked to shelter in place as the pursuit for Dzhokhar Tsarnaev continues.
	The Watertown neighborhood adjacent to the shootings is sectioned off and law enforcement agencies are assigned sections to systematically search.
10:35 am	U-Mass Dartmouth, where Dzhokhar Tsarnaev is a student, is evacuated.
6:30 pm	No one has been found in the intense manhunt. Massachusetts Governor Deval Patrick lifts the lockdown for Boston
6:55 pm	Watertown resident David Henneberry checks the boat in the back of his Franklin Street home and finds the tarp torn and bloody. He alerts Watertown Police.
7:00 pm	Boston Police Superintendent Billy Evans arrives at the Franklin Street home to begin a multi-agency effort to apprehend the suspect. Shortly thereafter, guns are fired at scene.
8:45 pm	Dzhokhar Tsarnaev is captured and the incident concludes

It is 102 hours after the explosions on Boylston Street

Appendix Two

Map of the Boston Marathon Bombing Response



Appendix Three

Partial List of Interviewees and Focus Group Participants

The authors of this report express their thanks to the people listed below for sharing their experiences and insights, and even more so, convey appreciation for their service during the Boston Marathon Bombings Response. This list does not include the numerous people with whom informal discussions took place.

Colonel Timothy Alben, *Superintendent***,** Massachusetts State Police

Dr. Brien Barnewalt, *Chairmen and Chief of Emergency Medicine,* Tufts Medical Center

Dr. Calvin Brown, *Associate Chief of Emergency Medicine,* Faulkner's Hospital

Brian Correia, *Senior Group Manager*, Global Continuity and Resilience, Target Corporation

Dr. Paul Biddinger, *Chief,* Division of Emergency Preparedness, Massachusetts General Hospital

Dr. Peter Burke, *Chief of Trauma Services,* Boston Medical Center

Dr. Sarita Chung, *Assistant in Medicine,* Boston Children's Hospital

Chief Edward Davis, *Commissioner***,** Boston Police Department

Richard DesLauriers, *Special Agent in Charge***,** Boston Field Office, Federal Bureau of Investigation

Chief Edward DeVeau, *Chief of Police***,** Watertown Police Department

William Evans, *Superintendent***,** Boston Police Department

Rene Fielding, *Director,* Office of Emergency Management, City of Boston

Dr. Jonathan Fischer, *Director of Undergraduate Education,* Department of Emergency Medicine, Beth Israel Deaconess Medical Center

Dr. Jonathan Gates, *Medical Director of Trauma* Services, Brigham and Women's Hospital

Dr. Alok Gupta, *Program Director,* Surgical Critical Care Fellowship, Beth Israel Deaconess Medical Center

Tom Grilk, *Executive Director***,** Boston Athletic Association

James Hooley, *Chief of Department***,** Boston Emergency Medical Service

Dr. Horatio Hojman, *Surgical Director,* Surgical Intensive Care Unit, Tufts Medical Center

Sean Kelly, *Reporter***,** WCVB Channel 5 News

Daniel Linskey, *Superintendent in Chief***,** Boston Police Department

Honorable Thomas Menino, *Mayor***,** City of Boston

Dave McGillivray, *Race Director***,** Boston Athletic Association

Governor Deval Patrick, *Governor***,** State of Massachusetts

Steven Riccardi , *Special Agent in Charge***,** Boston Field Office, United States Secret Service

General Scott Rice, *Commanding General***,** Massachusetts National Guard

Kurt Schwartz, *Director,* Massachusetts Emergency Management Agency

Richard Serino, *Deputy Administrator***,** Federal Emergency Management Agency

Alan Snow, *Director of Safety and Security,* Boston Region, Boston Properties

Christina Sterling, *Spokesperson*, U.S. Attorney's Office

Glenn Straughn, *Store Team Leader,* Target Corporation

John Tello, *Assistant Director of Safety and Security*, Boston Properties

Dr. Andrew Ulrich, *Assistant Professor of Emergency Medicine,* Boston Medical Center

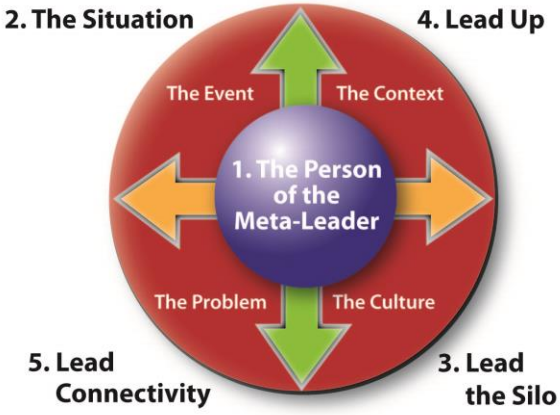
Mitch Weiss, *Chief of Staff***,** Office of the Mayor**,** City of Boston

Appendix Four

Brief on Meta-Leadership

The Work of Meta-Leadership

Crisis leadership and complex problem solving with multiple stakeholders requires meta-leaders to reach out inclusively. A unifying mission and purpose is forged that connects people across a wide expanse of activity. Different perspectives and information integrate to shape a wide picture of assets, options, and actions.



The Impact of Meta-Leadership

Meta-Leaders are force-multipliers, leveraging a wide expanse of perspective and capability. By intentionally linking the efforts of many silos of activity, meta-leaders galvanize a valuable *connectivity* of thinking and action within and across organizational entities. Performance follows practice: meta-leaders see and do more because the discipline integrates a larger span of analysis and activity.

Meta-Leadership reframes the process and preparation of leaders. It has three functions: 1) A comprehensive organizing *mission* to understand and integrate the many facets of leadership; 2) A *method* to engage collaborative activity; 3) A cause and *purpose* to improve organizational functioning and resilience. Following are the dimensions to the learning and practice of meta-leadership:

The Person of the Meta-Leader: Emotional intelligence: self-awareness and self-regulation. The capacity to lead despite fright: fear takes you to your *emotional basement*. Meta-leaders lead themselves and others up & out of the basement to higher levels of thinking and functioning.

The Situation: With often incomplete information, the meta-leader creates a broad reach, used to determine what is happening, the presenting choice points, and then to chart and meta-lead a course of action, effectively recruiting wide engagement and support. The POP-DOC LOOP drives this process.

Connectivity: The definition of Meta-Leadership is "People Follow You." In other words, "You're It!" The Meta-Leader engages the many involved stakeholders, often leveraging influence beyond authority. With a multi-directional view and understanding that any situation affects each stakeholder differently, the Meta-Leader is able to simultaneously:

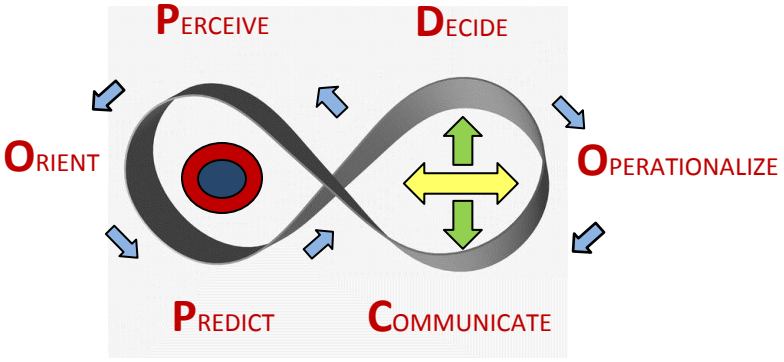
1. *Lead Down:* The meta-leader models confidence, inspiring subordinates to follow and succeed, encouraging strong, effective followers who themselves further galvanize cross-silo connectivity.

2. *Lead Up:* Validating the power-authority equation, the meta-leader effectively *leads up to the boss*. Truth to power, effective communication, and being a great subordinate are critical.

3. *Lead Across:* Meta-leaders strategically devise cross-silo linkages that leverage expertise, resources, and information across a wide spectrum of stakeholders, integrating capacity and problem solving.

Appendix Five

Brief on the POP-DOC Loop



Meta-Leadership Momentum

The POP-DOC loop guides the direction of the meta-leader as well as the enterprise that he or she is navigating. Exercising the six sequential activities is an intentional process of paying attention amidst the many distractions of complex problem solving.

The Continuous Mobius Loop

POP-DOC is represented by the Mobius Loop[xii], a continuous ribbon that, with its twist, is a 2-dimensional object. You start at perceive and once around, you perceive again to assess the impact of what was done. The twist is at "Operationalize:" this is when you as a leader can turn the situation around. The process requires careful perceiving, orienting to patterns of activity, and then predicting what likely happens next. Decisions derive from what is learned in the POP Loop. Actions are then executed and communicated in the DOC Loop.

POP-DOC Impact

The POP-DOC Loop drives the performance and the outcomes of meta-leadership practice. Each side prepares and reinforces the other. One danger is getting caught in the POP Loop: waiting for more information, refusing to make decisions, and demanding further analysis. Another danger is getting caught in the DOC Loop, taking actions in haste without careful assessment of the situation and what can be done about it. The Loop guides continuous analysis and action.

1. ***Perceive***: There is much for the meta-leader to perceive: data, the senses, the people, and situation. A wide and insightful purview is critical. Without it, the effort moves blind. Beware distractions.

2. ***Orient***: All that is perceived is assessed for patterns of activity that can be understood and explained. Seek stimulus-response reactions and factors that prompt variance from the expected.

3. ***Predict***: With patterns accurately perceived, they can be projected to the future, so that the meta-leader anticipates and acts upon what likely could happen next, a critical meta-leadership tool.

4. ***Decide***: The POP Loop informs decision-making and is particularly significant when many stakeholders are involved, much is at stake, and risk-laden decisions must be reached.

5. ***Operationalize***: As decisions are placed into action, a different part of the brain is activated: commitments and their inherent risks require the meta-leader to pay attention to impact and outcome.

6. ***Communicate***: Decisions, actions and information must be communicated outbound so stakeholders are aware; likewise, inbound communication informs the next loop through POP-DOC.

Appendix Six

Discussion Questions

Use these questions for an assessment of your organization and community, and to spur conversations to identify challenges and opportunities.

1. Have you seen something akin to swarm intelligence in your community? When? How could you enhance your swarm intelligence capacity and capability?

2. Which of the principles of swarm intelligence do you see as most evident in your organization and community?

3. How strong is the connectivity between public, private, and non-profit organizations in your community? Give specific examples. What are your best practices? Where are your opportunities to improve them?

4. How strong is the connectivity between political leaders and preparedness/response professionals in your community? How might the trust equation be used to further improve those relationships?

5. What cross-organizational trainings and drills have you conducted? What did you learn from them?

6. Have you involved the private or non-profit sectors in your trainings and drills? What did you learn from them?

7. If you answered "no" to Question 3 or 4, how might you integrate cross-organizational and cross-sector opportunities into your activities?

8. Have you used live events as an opportunity for training and drills? If so, what have you learned? If not, what opportunities do you see?

9. Using the steps in the POP-DOC Loop, why might you or other leaders fail to perceive, orient, predict, decide, operationalize, or communicate? At which steps do you believe you are strongest? At which is there the greatest room for improvement?

Appendix Seven

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