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Emergency Response in Large-Scale Disasters: Lessons Learned and Implications for National Security

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EMERGENCY RESPONSE IN LARGE-SCALE DISASTERS:

LESSONS LEARNED AND IMPLICATIONS FOR NATIONAL SECURITY

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This work analyzes the domestic emergency management policy of the United States and the extent to which it reflects an imbalance in U.S. national security policy. It tests the thesis that despite the rhetoric of enhanced emergency management capabilities in the aftermath of the terrorist attacks of 9/11, the U.S. still remains vulnerable to large-scale domestic emergencies due to a lack of adequate planning and resources. This vulnerability stems from a failure to implement lessons learned from large-scale domestic incidents such as the terrorist attacks of 9/11 and the Northeast Blackout of 2003. Since U.S. security policy is heavily focused on military and foreign policy issues, emergency response capabilities have not been a priority and are not substantial enough to respond effectively to a large-scale domestic emergency. However, the two policy areas, foreign/military and domestic, are interconnected and mutually dependent. Since the threat of terrorism can never be fully eradicated, foreign/military and domestic security policies should be balanced so that if and when another attack occurs, the U.S. can respond effectively.

This work uses the terrorist attacks of 9/11, the Northeast Blackout of 2003, and the State of Connecticut's emergency training exercises as case studies to test this thesis. Interviews with first responders provide additional original research to supplement the data gathered from online resources, articles, and government reports. The concluding chapter demonstrates why a more balanced approach to security policy, both domestic and foreign/military policy, is necessary if the U.S. is to be successful in the "war on terrorism." This work proves the thesis that the U.S. still remains unprepared for another domestic terrorist attack or other large-scale domestic emergency, and provides recommendations to further enhance response capabilities.

To my grandfather, William Sodlosky, for all his love and support,

To Ama for her never-ending strength and incredible grace,

And to my momma for valuing my education more than anything else,

And for being there, always.

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INTRODUCTION

Domestic national security is a complicated, comprehensive issue that challenges American political processes and structures. Whether domestic crises are man-made or natural, national security includes being prepared to respond to them effectively, efficiently, and in a timely manner, regardless of where or when a crisis occurs.

Since the terrorist attacks of September 11, 2001, there have been initiatives to enhance domestic aspects of national security. However, the United States has focused its national security policy largely on the ongoing military conflicts in Afghanistan and Iraq and on foreign policy issues. This is reflected, for example, in the massive allocation of funds and resources to the Department of Defense. However, as Stephen Flynn points out, preparedness for domestic crises is also an essential element of national security strategy. He argues that our response to domestic crises is deeply flawed, which has negative consequences for broader issues of national security. Despite the creation of the Department of Homeland Security in response to the 9/11 attacks, the federal government still lags in helping communities prepare for, respond to, and recover from disasters, as was evident in the management of Hurricane Katrina and the Northeast Blackout of 2003.

In *The Edge of Disaster*, Flynn addressed many weaknesses in our domestic security, such as the nation's aged and poorly maintained infrastructure, including bridges, levees, reservoirs, power grids, and similar structures that are vital to the

day-to-day activities of all Americans. The fact that these structures are deteriorating should be cause for alarm because their failure would be highly disruptive and because they provide an attractive target for terrorists who seek that disruption. Another weakness that Flynn found was the inadequacy of medical care for victims of large-scale emergencies. There are problems of insufficient hospital capacity to meet the surge of demand in a crisis. Often medical care and basic supplies have not been efficiently or effectively provided following disasters. While the federal government plays a role in disaster response, first responders are preponderantly local, e.g. emergency medical technicians, fire fighters, and law enforcement personnel. If they do not have adequate resources (such as up-to-date communications systems and sufficient equipment) and training to facilitate collaboration and ensure information sharing in an emergency situation, they will not be successful in their management efforts, causing potentially massive loss of life and economic damage.

To assure effective response to domestic crises, Flynn argues that federal agencies such as the US Coast Guard and the Federal Emergency Management Agency (FEMA) should not be diverted from their emergency management responsibilities; moreover, they should be provided with sufficient funding, personnel, and training so that they can adequately respond to disasters. This relates in part to the argument that Richard Clarke makes in *Your Government Failed You*, that the Department of Homeland Security is an ineffective organization. He posits that it was created with a political agenda that misunderstood the problem that it was meant to solve, and was also a poorly structured organization run by unqualified political appointees.

Thesis and Research Questions

This work tests the thesis that despite the post-9/11 rhetoric about change and coordination, the lessons of 9/11 were not translated into significantly improved means to respond to natural or man-made domestic disasters. While lessons have been learned from large-scale emergencies such as 9/11 and infrastructure failures such as the Northeast Blackout of 2003, few of these lessons have been implemented into effective response plans at the local, state, or national levels. These failures are indicators of a major flaw in U.S. national security policy, which focuses too heavily on foreign and defense aspects of security without adequate preparation for domestic aspects.

We are more vulnerable to both natural and man-made disasters because we are failing to improve infrastructure and disaster management plans. This negligence has negative implications for national security. If we are unable to respond effectively to natural disasters, how will we be able to respond to terrorist attacks? If our ailing infrastructure is ignored, will it provide vulnerabilities that can be used by terrorists? It is important to include military and foreign policy initiatives in any national security policy, but it is equally important to ensure that the country is able to withstand attacks against it, which includes being able to prepare for, respond to, and recover from disasters of any magnitude or source. In other words, there needs to be a balance between foreign/military and domestic national security policies in order to minimize our vulnerabilities and, as of yet, that balance has not been achieved.

Relevant research questions to test this thesis include:

1. What lessons about domestic disaster preparedness and response were learned from the response to 9/11?

2. To what extent were the lessons learned from 9/11 implemented, and how were those lessons reflected in the response to other large-scale emergencies such as the Northeast Blackout of 2003?

3. What lessons were learned from the Northeast Blackout, and to what degree have they been reflected in changes to emergency preparedness and response initiatives in Connecticut?

4. What are the national security implications that can be drawn from the responses to these large-scale emergences?

5. In what ways can U.S. domestic disaster response be improved to meet the country's national security needs?

Methodology

This work is based on analysis of relevant secondary material (books, journal articles, newspaper and news journal articles) and original documents (e.g., legislation, Congressional hearing testimony, official government reports). This research is supplemented by interviews with first responders who have relevant experience in emergency response.

Additionally, two case studies will be used to demonstrate the vulnerabilities and potential for effectively handling domestic crisis. The terrorist attacks of 9/11 were chosen because they were the first major attack by a foreign terrorist organization on U.S. soil. As such, they tested the ability of the U.S. to respond to a large-scale attack and serious vulnerabilities in response efforts were revealed. The

Northeast Blackout of 2003 was chosen as a man-made disaster that affected a significant number of people and involved response efforts that were widespread and varied. The State of Connecticut's emergency training exercises were chosen as a case study to determine the extent to which lessons from 9/11 and the Blackout have been implemented and incorporated into emergency management practices.

Literature Review

Some of the literature focused narrowly on matters related to the response to domestic crises as areas of vulnerability that undermine national security overall. Such issues included failures with infrastructure and problems for effective initial response to man-made or natural disasters, which are especially important to note in the current age of terrorism. Notable works in area include: two books by Stephen Flynn, *America the Vulnerable: How Our Government is Failing to Protect Us from Terrorism*[1] and *The Edge of Disaster: Rebuilding a Resilient Nation*[2]; and a few works by Richard Clarke: *Your Government Failed You: Breaking the Cycle of National Security Disasters*,[3] *The Forgotten Homeland*,[4] and "Ten Years Later".[5]

There is a substantial literature on the lessons for national security to be drawn from the terrorist attacks of 9/11. Literature used in this work include The 9/11

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[1] Stephen Flynn, *America the Vulnerable: How Our Government is Failing to Protect Us from Terrorism* (New York: HarperCollins Publishers, 2005).
[2] Stephen Flynn, *The Edge of Disaster: Rebuilding a Resilient Nation* (New York: Random House, 2007).
[3] Richard Clarke, *Your Government Failed You: Breaking the Cycle of National Security Disasters* (New York: HarperCollins Publishers, 2008).
[4] Richard Clarke, Rand Beers, et. al, *The Forgotten Homeland* (New York: The Century Foundation Press, 2006).
[5] Richard Clarke, "Ten Years Later," *The Atlantic Monthly*, (January/February 2005), pp. 61-77.

Commission Report[6] and relevant government publications such as: *Perspectives on 9/11: Building Effectively on Hard Lessons*[7]; and legislation including the USA PATRIOT Act and the Intelligence Reform and Terrorism Prevention Act.

A few works focused on the Northeast Blackout of 2003. Relevant texts include: *Enhancing New York City's Emergency Preparedness*,[8] which provided an overview of the response to the Blackout as well as lessons learned from the response to the incident; *Effects of Catastrophic Events on Transportation System Management and Operations*,[9] which focused on the effects the Blackout had on transportation systems and evacuation efforts; and *Blackout of 2003: Pubic Health Effects and Emergency Response*,[10] which studied the public health response during the Blackout and areas where improvements could be made.

This Work's Contribution to the Literature

The preponderance of writing on the 9/11 attacks focuses on national security problems in terms of military and foreign policy issues. The literature on domestic response to the specific crisis of the Northeast Blackout does not consider its implications for national security. The contribution of this work is to analyze the

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[6] National Commission on Terrorist Attacks Upon The United States, *The 9/11 Commission Report* (New York, New York: W.W. Norton & Company, Ltd., 2004).
[7] Hearing before the Select Committee on Homeland Security House of Representatives, One Hundred Eighth Congress, First Session (September 10, 2003).
[8] New York City Emergency Response Task Force, *Enhancing New York City's Emergency Preparedness: A Report to Mayor Michael R. Bloomberg*, (New York City: October 28, 2003).
[9] Allan J. DeBlasio, Terrance J. Regan, Margaret E. Zirker, Katherine S. Fichter, Kristin Lovejoy, *Effects of Catastrophic Events on Transportation System Management and Operations* (Cambridge, Massachusetts: April 2004).
[10] Mark E. Beatty, Scot Phelps, Chris Rohner, Isaac Weisfuse, "Blackout of 2003: Public Health Effects and Emergency Response," *Public Health Reports*, Vol. 121 (Jan-Feb 2006).

lessons for national security from response to domestic crises, using one caused by terrorists, 9/11, and one that demonstrated our ailing infrastructure, the Blackout.

This work provides some insight as to how our current emergency response plans have evolved, whether the lessons learned from previous disasters are being implemented and whether initiatives have been successful at solving the problems they were intended to solve.

Organization of the Work

The 9/11 attacks* dramatically exposed many U.S. security vulnerabilities. In the aftermath of the terrorist attacks a variety of groups and individuals attempted to draw lessons from the tragedy to strengthen U.S. defenses against terrorist attacks and enable the country to respond more effectively to any that might occur in the future. Chapter One analyses the lessons that were learned from the attacks of 9/11 that relate to ways U.S. domestic security could be improved, areas in which vulnerabilities existed, and how domestic security could be strengthened.

A second case study analyzes the degree to which lessons learned from the 9/11 attacks were implemented during a subsequent major emergency and what areas still needed to be improved. Chapter Two focuses on the man-made disaster of the Northeast Blackout of 2003. As Flynn argued in *The Edge of Disaster*, ensuring that critical infrastructure is up-to-date is imperative in order to reduce attractiveness as a terrorist target. The Blackout illustrated how vulnerable U.S. physical infrastructure

*The terrorist attacks of 9/11 resulted in planes crashing into the World Trade Center, the Pentagon, and a field in Pennsylvania. Since the destruction caused by the attacks in New York City was so substantial and efforts to respond were flawed, New York City is the case study for the 9/11 attacks.

is to outside forces and how these vulnerabilities affect U.S. national security. This emergency also illuminated how U.S. reliance on modern technology was a severe national security risk.

Chapter Three focuses on the extent to which the lessons from 9/11 and the Blackout have been implemented in Connecticut. Connecticut was chosen because of its close proximity to New York City, which was greatly affected by the terrorist attacks of 9/11 and the Northeast Blackout. Since Connecticut is so close to a major city and is therefore likely to be the target of another terrorist attack, it is important to see how Connecticut has developed and improved its emergency preparedness initiatives and response plans.

This work ends with a concluding chapter, which discusses the general findings and the degree to which the thesis of this work was proven. Additionally, the contribution that this work makes to the literature on the topic is analyzed and areas for further research are identified.

CHAPTER ONE

SEPTEMBER 11TH: WHAT WENT WRONG?

The terrorist attacks of 9/11 illustrated the ways in which our domestic security was lacking and how our domestic response to large-scale emergencies needed to be improved if the United States hoped to be able to respond to disasters in the future. This chapter begins by analyzing the lessons learned from the terrorist attacks of 9/11 that related to issues of domestic security. These include lessons for first responders, policy makers in the federal government, and the private sector.

The second part of the chapter focuses on the vulnerabilities that became apparent during the response to the 9/11 attacks. They include the resources upon which first responders relied (such as communication systems) as well as structural, procedural and operational problems. They also include failures such as breakdowns in communication and inadequate standard operating procedures in the federal government's response to the attacks, as well as the lack of emergency management plans and evacuation procedures in the private sector.

The chapter concludes by analyzing recommendations by the 9/11 Commission and other sources that directly relate to issues of domestic security. They fall into three general categories: recommendations to improve resources for first responders, including establishing standard operating procedures and improving communications; recommendations for bureaucrats and policymakers, including increased oversight of homeland security efforts; and recommendations for the

private sector, including standards for developing evacuation plans and emergency response procedures.

Many different groups in and out of the government investigated the causes and implications of the 9/11 attacks. Of these, particularly influential recommendations were made in five reports. The most prominent was written by an independent joint commission established by Congress and the Executive Branch, *The 9/11 Commission Report*. An investigation that focused on the Fire Department of New York (FDNY) and the emergency medical services (EMS) units was conducted by the consulting firm McKinsey & Company, titled *Increasing FDNY's Preparedness*. Several reports by think tanks added to the wealth of information and recommendations, including two task force reports by the Council on Foreign Relations, *Emergency Responders: Drastically Underfunded, Dangerously Unprepared* and *American Still Unprepared – America Still in Danger*. A book by the RAND Corporation provides further research and influential recommendations, *Protecting Emergency Responders: Lessons Learned from Terrorist Attacks*. In referring to the findings and recommendations of these various sources, the following designations will be used: 9/11 Report for *The 9/11 Commission Report*; McKinsey Report for *Increasing FDNY's Preparedness*; First Responders Report for *Emergency Responders: Drastically Underfunded, Dangerously Unprepared*; CFR Report for *American Still Unprepared – America Still in Danger*; and RAND Report for *Protecting Emergency Responders: Lessons Learned from Terrorist Attacks*.

Lessons for Domestic Security from the 9/11 Attacks

Because the United States had never before experienced the extent of destruction caused by terrorist attacks on 9/11, many lessons were learned about the roles and responsibilities of local, state, and federal government agencies, and the private sector in responding to a large-scale disaster. Moreover, it became clear that even if roles and responsibilities were clear and established enough to be carried out with some degree of effectiveness, they needed to be supported by appropriate resources, training, and formal procedures.

First responders

When a large-scale emergency occurs, local fire fighters, law enforcement, and EMS are expected to be able to respond to the disaster in a timely and effective manner. They are primarily tasked with rescuing and treating victims. First responders also need to consider other factors that contribute to how well they are able to respond, including planning and managing an organized response effort, establishing a clear chain of command, using standard operating procedures to make certain that the response is well coordinated and productive, and assessing the situation to determine if more help is needed. Unfortunately on 9/11, some of these goals were not achieved. While many first responders acted heroically despite flawed equipment, inadequate training, and bureaucratic confusion, the response to the terrorist attacks demonstrated the need for improved resources for first responders.

The first lesson from 9/11 was that in order for first responders to save lives in a large-scale emergency, communications equipment (which serves a vital function

for first responders during a disaster) needed to be updated.[12] Additionally, in order for communication to occur between different jurisdictions and departments, communications equipment needed to be interoperable.[13]

The second lesson was that coordination with other departments, neighboring jurisdictions, and representatives from the private sector must occur before a disaster strikes in the planning phases and must be maintained during the emergency response phase.[14] This interagency collaboration is important in various aspects of disaster planning and response, including training exercises, ensuring that standard operating procedures (SOPs) can be integrated across agency lines, and ensuring that communication remains open during emergency response so that everyone is informed about important developments.[15] Exercises that practice responses to real disaster scenarios should also be held with other agencies and jurisdictions so that when a disaster occurs cooperation between different organizations can be maximized and carried out smoothly.[16]

The third lesson was that SOPs, including chain-of-command structure and delegating roles and responsibilities, needed to be further developed and implemented by first responder organizations.[17] While technology issues were a contributing factor to the hampered communication efforts of first responders, a lack of SOPs for an

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[12] http://www.cbsnews.com/stories/2004/05/18/terror/main618272.shtml
[13] http://www.dhs.gov/xnews/releases/press_release_0529.shtm
[14] Warren B. Rudman, Richard A. Clarke, Jamie F. Metzl, *Emergency Responders: Drastically Underfunded, Dangerously Unprepared* (New York, New York: Council on Foreign Relations, 2003), p. 23.
[15] McKinsey & Company, p. 21.
[16] Brian A. Jackson, D. J. Peterson, James T. Bartis, Tom LaTourrette, Irene T. Brahmakulam, Ari Houser, Jerry M. Sollinger, *Protecting Emergency Responders: Lessons Learned from Terrorist Attacks* (California: RAND, 2002), p. 61.
[17] *Ibid*., p. 62.

incident as extensive as the terrorist attacks created confusion and mismanagement of both equipment and human capital. On 9/11, at various points throughout the day, the command and control structure was unclear.[18] Since clear leadership is imperative in an emergency, SOPs for large-scale incidents should be developed and implemented.[19] In addition, procedures for off-duty personnel, personnel changing shifts, and for personnel who are not assigned to the emergency need to be included in any emergency response plan.[20] Training should be conducted on a routine basis to ensure that the standard operating procedures listed above are understood by all emergency responders, as well as those operating in the private sector.[21]

The last major lesson pertained to the ability of first responders and commanders to access and gather intelligence information and updates about the situation as it occurred.[22] First responders need to be able to determine what is occurring on the ground as well as what is happening beyond the incident to make informed decisions about the distribution of personnel and resources. Incident commanders must also have appropriate systems in place to manage this information, as well as a way to track their resources and deployed units.[23]

The federal government

While local first responders are responsible for the immediate response to an emergency, the federal government has an important role to play in disaster response

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[18] McKinsey & Company, pp. 33, 48.
[19] *Ibid*., p. 14.
[20] *Ibid*., p. 15.
[21] Rudman, p. 23.
[22] *Ibid*., p. 12.
[23] *Ibid*., p. 13.

when there is a large-scale emergency that has national implications or overwhelms the capacity of local, state, or regional response.[24]

A major lesson from the 9/11 terrorist attacks was that there was no central agency in the federal government to coordinate activities related to homeland security. Many different agencies, such as the Transportation Security Administration, U.S. Coast Guard, and U.S. Customs and Border Protection, among others, play an active role in ensuring that the United States is protected from attacks. However, prior to 9/11, they were spread across the federal bureaucracy with limited coordination among them, which led to a lack of accountability.[25] To ensure that these agencies communicated with each other and shared pertinent information that might prevent a catastrophic event such as another terrorist attack, agencies that supported U.S. homeland security efforts needed to develop a more effective system to encourage information sharing.[26]

A second lesson was that the federal government needed to work more with local and state emergency response agencies to develop a national response plan and implement standards for responding to a large-scale emergency.[27] While local and state emergency managers provide a wealth of experience in disaster response and are crucial to the creation of a national response plan, other experts in the field, such as academics and representatives of the private sector must also be included in the

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[24] Michael K. Lindell, Carla Prater, Ronald W. Perry, *Introduction to Emergency Management* (Massachusetts: John Wiley & Sons, Inc., 2007), p. 28.
[25] Patricia A. Dalton, Testimony Before the Subcommittee on Government Efficiency, Financial Management, and Intergovernmental Relations, Committee on Government Reform, House of Representatives, *Combating Terrorism: Intergovernmental Cooperation in the Development of a National Strategy to Enhance State and Local Preparedness* (Washington, D.C.: Government Accountability Office, 2002), p. 2.
[26] http://www.whitehouse.gov/omb/rewrite/budget/fy2005/homeland.html
[27] Rudman, p. 4.

process, since they have expertise in emergency management from other perspectives.[28]

A third lesson was that oversight of homeland security in Congress was fragmented and that "the proliferation of committees and subcommittees [made] it hard to devise a coherent homeland security policy and focused homeland defense system."[29] Since there are so many agencies that work with homeland security and homeland security issues relate to other issues, there was no central committee to oversee all homeland security issues. This became especially relevant once the Department of Homeland Security was created. Since congressional committees are responsible for oversight to ensure effectiveness and accountability, creating a primary committee in Congress would streamline the process. Ideally, a homeland security committee in both the Senate and the House of Representatives would be able to make funding and resource decisions for homeland security initiatives in a nonpartisan manner.[30] Determining funding allocations is an important part of Congressional responsibility. It is particularly imperative when dealing with homeland security since without funding many local and state jurisdictions are not able to provide their first responders and other groups responsible for emergency management with the necessary equipment and resources to properly respond to a large-scale emergency.[31]

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[28] Gary Hart, Warren B. Rudman, Stephen E. Flynn, *American Still Unprepared – America Still in Danger* (New York, New York: Council on Foreign Relations, 2002), p. 33.
[29] Rudman, p. 19.
[30] *The 9/11 Commission Report*, p. 421.
[31] Rudman, p. 10.

The private sector

The private sector has a crucial role to play in disaster planning, response, and recovery. Since it controls 85% of the infrastructure in the United States, its members must take an active role to ensure that their buildings, facilities, particularly those that are considered essential systems or high-impact targets, and other infrastructure adhere to national safety standards and are constructed in a way that takes potential disasters into consideration.[32] Other components of infrastructure, including communications systems, should be included in building codes to support first responders.[33]

One of the most common criticisms of the private sector's response to the 9/11 attacks was that most companies did not have adequate evacuation procedures.[34] In order for a company to save lives, it must develop and implement an effective emergency response plan, and those plans must be carried out in training exercises to make certain that employees are familiar with the established emergency protocols.[35]

The third lesson applied to private sector emergency response services. In the response to the 9/11 attacks, many private companies that engage in first responder activities did not follow established procedures. For example, instead of getting authorization from dispatchers to provide on-scene support, private organizations bypassed the dispatchers and simply arrived at the scene to assist with emergency response efforts. Coordinating with local first responders and abiding by previously

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[32] *9/11 Commission Report*, p. 317.
[33] McKinsey & Company, p. 91.
[34] *9/11 Commission Report*, p. 281.
[35] *Ibid.*, p. 398.

established SOPs would ensure a more effective response, fewer lives lost, and a proper distribution of resources.[36]

Areas of Vulnerability

The City of New York experienced a similar situation to the 9/11 terrorist attacks in 1993, but on a much smaller scale. While terrorists tried to bomb the World Trade Center (WTC) in 1993, the structural damage and lives lost then did not compare to the second attacks. The attacks of 9/11 posed a more serious challenge because first responders had not previously dealt with a situation of this magnitude. Therefore, the systems and procedures they had in place were quickly overwhelmed.[37]

First responders

It became apparent on 9/11 that the communications systems on which the local first responder agencies had relied were not sufficient in a large-scale emergency. First, the communications systems simply could not handle the situation.[38] The radio spectrum of the equipment used by first responders to the attacks that day was not enough to support their communications. The volume of communications, from police, fire, and EMS, overwhelmed the system as well as the dispatchers. This was exacerbated by the fact that many of the communications facilities in the immediate area of the WTC were knocked out by the attacks.[39]

A problem for first responders that had been encountered in the earlier attacks on the WTC was that their communication equipment could not operate in the high-

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[36] McKinsey & Company, p. 9.
[37] Louise K. Comfort, "Managing Intergovernmental Responses to Terrorism and Other Extreme Events," *Publius: The Journal of Federalism*, Vol. 32 (Fall 2002), p. 39.
[38] *9/11 Commission Report*, p. 322.
[39] Comfort, p. 41.

rise buildings that dominate the New York City landscape. Therefore, on 9/11 many radios failed simply because the first responders were surrounded by skyscrapers.[40] While the portable radios work better when there are repeater systems, the repeater system in the WTC was found to be damaged as a result of the attacks.[41] The old equipment that proved to be insufficient in 1993 had not been updated even though new radios had been ordered in 1999. However, efforts to utilize them before 9/11 were unsuccessful.[42] Fortunately, the attacks did not take place on a subway or in a tunnel, because the radio communication equipment that the emergency services personnel used could not operate in those locations.[43] The issues that first responders encountered with communications equipment not only hindered response efforts but also made "accountability of personnel impossible."[44]

Since the repeater channels were not working the fire chiefs who were in charge on 9/11 decided to use two other channels – a tactical channel to communicate with the fire fighters, and a command channel to communicate with the other chiefs.[45] Many of the firefighters did not know that this switch had occurred, and those who did know did not receive all of the messages because even the tactical channel was not operating to full capacity. Matters were made worse by the fact that the frequency of the command channel that the fire chiefs were using was being shared with a citywide first responder channel. Therefore, the chiefs had a difficult time

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[40] McKinsey & Company, p. 7.
[41] *Ibid*., p. 31.
[42] *Ibid*., p. 58.
[43] *Ibid*., p. 88.
[44] *Fort Hood Sentinel*, May 21, 2009, A6: 1.
[45] McKinsey & Company, p. 31.

communicating with each other because their channel was overwhelmed with other emergency responder dispatches and communications.[46]

When fire chiefs and other incident commanders were able to locate their units and determine the status of personnel, they relied on magnetic boards that were eventually destroyed when the towers collapsed. The magnetic boards had magnetic pieces that could be moved around the board to indicate the changing location of units or resources. While these boards had been sufficient ways to track personnel in the past, they proved to be inadequate on 9/11. The information that the incident commanders obtained about their units was not easily transferable to other agencies or command posts, and since the data could not be stored or backed up, it was all lost when the towers collapsed.[47]

While first responders experienced problems communicating with members of the same department due to dated equipment and overburdened systems, communication issues went beyond the boundaries of each agency. Since each of the first responder agencies maintained its own communications systems that were not interoperable, different agencies could not communicate with each other. For example, fire fighters could not receive updates from law enforcement officers, and emergency medical technicians could not coordinate with fire fighters to determine what medical resources were needed, and so on.[48]

Communication between departments and agencies was not hampered solely because of technological barriers. Bureaucratic tensions and a general lack of coordination prevented the NYPD and FDNY from sharing critical information about

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[46] *Ibid*., p. 45.
[47] *Ibid*., pp. 37, 96.
[48] http://www.kyw1060.com/pages/5617012.php?

what was going on.[49] There were no senior NYPD officers at the Incident Command Post that had been established by the FDNY, nor were there any FDNY chiefs in the helicopter that was hovering above the WTC.[50] The lack of coordination over intelligence and command and control led to unnecessary confusion and furthered aggravated the situation. While Mayor Giuliani attempted to bridge the gap between the various first responder agencies, he was unable to do so.[51]

Some breakdowns in procedure occurred on 9/11 within the FDNY that interfered with the response efforts. First, some units arrived at the WTC and proceeded into the burning towers or other areas of the site without first "staging," or reporting to their superiors at the designated check-in points. This led to chiefs not being able to keep track of their units, and units going into the buildings without vital information.[52] Second, some units that were assigned to other parts of the city came to Ground Zero to help without authorization from dispatchers. Dispatchers must give authorization for unassigned units to participate in response efforts because only the dispatchers know what resources and personnel are needed. Since these units did not receive authorization from the dispatchers, they might not have been needed at the WTC site, therefore putting more firefighters in danger, or they might have been needed to respond to other emergencies in the city.[53] Third, a full recall order was sent to all off-duty fire personnel. However, since the recall procedure had not been used in 30 years and personnel were not trained in how to respond in the event of a recall, there was substantial confusion about to whom or where to report and what

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[49] http://www.jems.com/news_and_articles/articles/Lessons_Learned_From_9_11.html
[50] McKinsey & Company, p. 32.
[51] *9/11 Commission Report*, p. 284.
[52] McKinsey & Company, pp. 29-30.
[53] *Ibid*., p. 35.

was expected of them, leading to an ineffective and haphazard response.[54] Fourth, because the attacks occurred around the time for shift change, responders who were going off-duty stayed on duty to help with response efforts. Not having a procedure in place for this sort of situation put more lives at risk and added to the heavy flow of information and requests that the dispatchers had to direct.[55]

Some of these procedural errors could have been prevented if a more organized leadership structure and more effective SOPs for command and control had been in place. Particularly because of the communication issues described above, the FDNY had a difficult time determining which personnel were in charge; throughout the day there were various command posts operating without knowledge of other command posts.[56] The structural collapse of the Twin Towers exacerbated this problem as incident command posts in the lobbies of the Twin Towers were destroyed.[57] These factors, in turn, led to more unorganized first responder efforts. The Port Authority Police Department also had no SOPs for joint command or radio communications procedures, which contributed to the overall confusion.[58]

As a result of SOPs being either non-existent or not followed, emergency managers were unclear as to what personnel and resources were needed to properly respond to the attacks. For that reason, they called on neighboring emergency response agencies to provide support. Unfortunately, however, no formal mutual aid agreements had been established prior to 9/11, so not only did the emergency managers in the area not know what resources were available to them from other

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[54] *Ibid*., p. 36.
[55] *Ibid*., p. 35.
[56] *Ibid*., pp. 33, 48, 49.
[57] *Ibid*., p. 33.
[58] *9/11 Commission Report*, p. 282.

agencies, they also did not know how to request or direct those resources. Since the emergency responder organizations did not have SOPs that could be integrated, personnel from neighboring jurisdictions were unfamiliar with the protocols that existed within the local responder agencies.[59]

Obtaining information is an imperative part of emergency response. Without accurate data, emergency managers cannot make informed decisions or manage an effective response plan. On 9/11, incident commanders did not have a stable, continuous, or accurate source of information.[60] This forced them to make decisions that were not fully informed, putting more lives at risk than was necessary.[61] The problems incident commanders faced was partly due to lack of or limited interagency coordination, especially between the NYPD and the FDNY. For example, if a fire chief had been in the NYPD helicopter mentioned above, he would have been able to provide crucial information to his colleagues on the ground to improve the response.[62]

Another factor that contributed to the lack of intelligence was the uncoordinated media response. There was no video feed established at the incident command posts, nor was there a media liaison to communicate information directly to the incident commanders. If there had been a steady stream of information from the news media, fire chiefs in charge would have been able to make more accurate assessments of the situation and distribute personnel and resources more efficiently.[63] So, in addition to communications issues between first-responder agencies, incident commanders also had limited, if any, access to reliable means of communication with

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[59] McKinsey & Company, p. 36.
[60] http://www.jems.com/news_and_articles/articles/Lessons_Learned_From_9_11.html
[61] McKinsey & Company, p. 40.
[62] *Ibid*., p. 38.
[63] *Ibid*., p. 40.

other localities, the state government, and federal agencies due a lack of secure radios, telephones, videoconferencing technologies or other forms of communication.[64]

The federal government

For many years, the national agencies that dealt with issues of homeland security functioned well in separate departments. However, the attacks of 9/11 showed the country that the fragmented homeland security structure created gaps in communication and failed to facilitate information sharing. For example, agencies that are responsible for collecting intelligence on terrorists, such as the Federal Bureau of Investigation (FBI), did not share information with other agencies that rely on such intelligence to carry out their duties. What was perhaps most disturbing about the terrorist attacks was the fact that the FBI did not or could not share critical intelligence within its own agency. Outdated computer systems and bureaucratic blockages prevented information from getting from a field office to another field office or FBI Headquarters.[65]

On 9/11, no national response plan existed to coordinate different agencies, departments, and jurisdictions in emergency management or to establish SOPs to support emergency response efforts. Collaboration between the federal government and local and state governments around emergency response was minimal, and the lack of coordination was apparent in the lapses in communication that occurred that

[64] Hart, p. 20.
[65] *9/11 Commission*, Chapter 8.

day and the unclear roles and expectations that hindered emergency management plans.[66]

The issue of funding and federal oversight was brought to light in the wake of the 9/11 attacks. People wondered why the first responders in New York did not have better equipment, why no standards for private sector preparedness had been established, and how coordination between two primary response organizations could have been so limited. Congress did not have a primary committee to oversee emergency management practices or to determine how funding should be allocated.[67] Since the federal government was concerned with making sure all states got some funding, cities like New York were not always prioritized when distributing funding.[68] They were left with outdated equipment and no funding for essential training programs. When funding was made available, there was no central legislative committee to ensure that the funds were being dispensed in a timely manner or used for initiatives or equipment that were truly needed.

The private sector

The first attacks on the WTC in 1993 should have been a wake-up call for the private sector, but unfortunately they were not. As a result, companies in the WTC and surrounding areas that were affected by the attacks did not have sufficient emergency response plans. For the few emergency response plans that were established in the private sector, the companies did not perform drills. If the companies had performed drills and implemented an evacuation strategy, not only

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[66] Rudman, pp. 4, 44.
[67] *Ibid*., p. 19.
[68] *9/11 Commission*, p. 395.

would weaknesses of the plans been identified so that modifications could have been made, but employees would also have been familiar with the evacuation procedure. [69]

While New York City had experienced the first terrorist attacks in 1993, the WTC was considered structurally sound, and not many people imagined the scenario that played out on 9/11 or the potential destruction it would cause. Since many emergency managers on 9/11 did not expect the Twin Towers to collapse,[70] incident commanders did not take precautions when establishing command posts in the lobbies of the WTC buildings.[71] In addition to the buildings not being able to withstand the impact of the planes, the communication systems in the WTC center that supported the first responder communication networks, like the repeater system, were not functioning properly because of the attacks.[72]

On 9/11, many private first responder companies and organizations responded to the attacks without authorization from city dispatchers. While they responded with good intentions and had probably circumvented established protocols for responding in the past, their efforts actually complicated matters due to the extent of the situation and the degree to which dispatchers were overwhelmed and the disaster response was unorganized.[73]

Information sharing between the public and private sector was found to be severely limited. Even though the private sector controls such a large majority of infrastructure in the US and because the private sector is the very first to respond to a disaster because its employees are immediately at risk, little coordination existed

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[69] *9/11 Commission*, p. 317.
[70] McKinsey & Company, p. 28.
[71] *9/11 Commission*, p. 291.
[72] McKinsey & Company, p. 31.
[73] *Ibid*., p. 9.

between the private sector and the federal government. Therefore, the private sector did not have access to critical information and could not respond more effectively to the attacks. Legal concerns are a key element of why coordination is so limited between the two sectors.[74]

Recommendations

Many reports and documents surfaced after 9/11 proposing changes that needed to be made to our national security structure to improve response to domestic, large-scale emergencies. The five most influential reports (indicated above) included the following recommendations.

First responders

Several reports recommended changes in equipment, substantial and continuous training, improved methods to monitor and manage personnel and resources, establishment of effective SOPs, and extensive interagency coordination. These recommendations targeted problems faced by first responders in the 9/11 attacks.

Suggestions for improving equipment began with concern about effective radio communication. Some of the problems that plagued first responders on 9/11 would not have occurred if reliable equipment had been in place and first responders had been trained in its operation. Proposed changes included the McKinsey Report recommendation that the new portable radios that were acquired in 1999 be evaluated to determine if they are more effective than the older radios. If found to be effective, the McKinsey Report recommended that they should replace the older radios. If not

[74] Hart, p. 32.

found suitable, alternative communication systems should be found.[75] In particular, the Report highlighted the need for communications equipment that functioned in high-rise buildings, tunnels and subways.[76]

Installing repeater systems (i.e. systems that facilitate radio communications by transmitting signals over a wider area) in high-rise buildings was one way to improve technological issues that surfaced on 9/11.[77] The CFR Report suggested that off-the-shelf technology that integrates different radio platforms could be utilized to achieve communications interoperability.[78] This Report also recommended that first responders receive adequate training in any new portable radio equipment. This training should include disaster simulation exercises to ensure that first responders are familiar with the equipment in emergency situations.[79]

The CFR Report also recommended that the federal government provide funding so that first responders could receive communications equipment, protective gear, detection equipment and proper training to enhance response capabilities.[80] The Report recognized the importance of assessing any new equipment and training received by first responders. Therefore, it recommended making contracts to ensure that long-term maintenance of both equipment and training programs remain up-to-date and functional.[81] The Report further recommended that grants be provided to

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[75] McKinsey & Company, p. 89.
[76] *Ibid*., pp. 92-93.
[77] *Ibid*., p. 90.
[78] Hart, p. 22.
[79] McKinsey & Company, p. 89.
[80] Hart, p. 11.
[81] *Ibid*., p. 22.

have retired first-responders perform evaluations on the status of the different components of urban emergency response preparedness.[82]

Even though first responders were not responding to a nuclear, biological, chemical, or radiological attack, they were exposed to many hazardous materials (hazmat) such as fibrous glass, particulate matter, and asbestos that have been linked to respiratory illness.[83] The CFR Report recommended obtaining protective gear and detection equipment for emergency personnel so that in the event of a hazmat incident, first responders could provide assistance to affected civilians.[84] Moreover, the McKinsey Report emphasized the importance of expanding hazmat capabilities, including interagency training and assessing potential threats and emergency service capabilities.[85] The RAND Report also recommended interagency training to build relationships and facilitate information sharing amongst different first responder agencies.[86]

So that incident commanders and emergency managers are better able to track personnel and resources, the McKinsey Report proposed that better methods for monitoring the status of units replace the magnetic boards that had been used on 9/11. The system that Report offered for evaluation and possible deployment was either a wireless electronic command board or a portable PC-based electronic board that would be able to back up data if the board were destroyed and would assist incident

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[82] *Ibid*., p. 21.
[83] Janet Heinrich, Testimony Before the Subcommittee on National Security, Emerging Threats, and International Relations, Committee on Government Reform, House of Representatives, *September 11: Health Effects in the Aftermath of the World Trade Center Attack* (Washington, D.C.: Government Accountability Office, 2004), p. 3-4.
[84] Hart, p. 10.
[85] McKinsey & Company, p. 74.
[86] Jackson, p. 61.

commanders through enhanced tracking and communication abilities.[87] Additionally, the McKinsey Report found that in order for pertinent information to be shared within and among departments and agencies, a better radio channel structure should be established so that the volume of data does not overwhelm communications systems and channels do not overlap.[88] The 9/11 Report recommended that Congress should support legislation to increase the radio spectrum in a timely fashion.[89]

Standard operating procedures

Many of the recommendations in the various reports focused on establishing more effective SOPs. The following areas were singled out for change: command and control structure; recall procedures; clarifying roles and responsibilities for dispatchers; and mutual aid agreements. To enhance the value of these changes, reports recommended extensive training to ensure that they are carried out effectively in an emergency.

To ensure that standard operating procedures, including a clear command and control structure in a large-scale emergency, are implemented, the McKinsey Report recommended that emergency response organizations expand the use of the Incident Command System (ICS), a component of the National Incident Management System (NIMS). This way, all first responders would have a common standard for flexible command and control, and different agencies and levels of government could more effectively coordinate their efforts. In order for ICS to be properly executed in an emergency situation, the McKinsey Report recommended that first responders receive

[87] McKinsey & Company, p. 96.
[88] *Ibid*., p. 93.
[89] *9/11 Commission Report*, p. 397.

sufficient training in its principles and procedures, and that continuous training be provided for high-ranking personnel since their role in ICS is so imperative.[90]

The last recall before 9/11 had occurred thirty years earlier. Therefore, many first responders were not familiar with procedures in place for a recall. The McKinsey Report recommended that emergency response agencies should establish formal recall packages that identify what procedures and personnel responsibilities would be in place in designated emergencies.[91] The Report also suggested that off-duty personnel who are not recalled should not be allowed to participate in response efforts.[92] Engaging in training exercises will help emergency responders understand these procedures in addition to understanding why following them is important. Enforcing rules regarding recall procedures is necessary to ensure that personnel are distributed effectively.[93] Specific protocols for staging should also be included in this training because some units did not stage before they arrived on the scene and did not receive important information to assist in their efforts, and incident commanders could not track those units.[94]

In addition to clarifying roles and responsibilities for on-site emergency response personnel, the McKinsey Report highlighted the importance of determining how dispatchers respond to a large-scale emergency. Because they are responsible for coordinating all emergency response personnel and resources, establishing effective means to handle the amount of data and communications that comes in during an emergency is paramount. To ensure effective management of resources,

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[90] McKinsey & Company, pp. 61-65.
[91] *Ibid*., p. 67.
[92] *Ibid*., p. 69.
[93] *Ibid*.
[94] *Ibid*., p. 72.

the Report proposed that dispatcher structure be evaluated to determine the appropriate roles and responsibilities for dispatchers in a large-scale emergency. Once those SOPs are established, the dispatchers should participate in training and drill exercises to make sure that the SOPs are successful.[95]

On 9/11, the City of New York relied on neighboring jurisdictions to support its emergency response capabilities. However, no SOPs existed for how those outside resources should be requested or managed.[96] Incident commanders did not have a true sense of the resources they actually needed or what resources were available to them from neighboring authorities. To remedy this problem, the McKinsey Report recommended adoption of mutual aid agreements outlining: the resources that would be available from each department or agency; how they would be requested and deployed; and how they would be managed by the commanding organization. To support these agreements, joint training exercises would be needed so that first responders would be accustomed to working with outside personnel and resources.[97]

One major theme in the McKinsey Report's recommendations was that interagency coordination is necessary for an emergency response plan to be effectively executed in both the preparation and response stages. The First Responders Report highlighted this crucial element in its recommendations, stating that

> DHS should develop a comprehensive national program for exercises that coordinates exercise activities involving federal agencies, state and local governments, and representatives from appropriate private sector

[95] *Ibid*., p. 95.
[96] *Ibid*., p. 36.
[97] *Ibid*., p. 70.

> entities including hospitals, the media, telecommunications providers, and others.[98]

That Report recommended that non-profit groups such as the American Red Cross should also be involved in training exercises. The First Responders Report emphasized the importance of ensuring that resources, roles, and responsibilities are fluid across agency lines, especially in the event that mutual aid agreements are enacted or funding is requested from higher levels of government. Improving emergency operation center capabilities could also support interagency coordination, as recommended in the Report.[99] In addition, a Government Accountability Office (GAO) Report highlighted the advantages of engaging in regional cooperation so that large metropolitan areas would be better prepared when an emergency occurs.[100]

The federal government

Recommendations for change by the federal government focused on establishing a single body to exercise oversight in Congress, streamlining the funding process, and coordinating more effectively with state and local emergency response agencies to create a national strategy for emergency preparedness and response.

One of the main recommendations of the 9/11 Commission relating to bureaucratic issues was that "Congress should create a single, principal point of oversight and review for homeland security."[101] This idea was expanded upon in the First Responders Report, which suggested that the United States House of

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[98] Rudman, p. 23.
[99] *Ibid*., p. 14.
[100] Report to the Chairman, Committee on Government Reform, House of Representatives, *Homeland Security: Effective Regional Coordination Can Enhance Emergency Preparedness* (Washington, D.C.: Government Accountability Office, 2004).
[101] *9/11 Commission Report*, p. 421.

Representatives should make the House Select Committee on Homeland Security a standing committee and "give it a formal, leading role in the authorization of all emergency responder expenditures in order to streamline the federal budgetary process."[102] It also suggested that the United States Senate should merge emergency preparedness and response oversight into the Senate Government Affairs Committee.[103]

To assist Congress in determining how funding should be allocated to first responder agencies, the 9/11 Report recommended that funding be based on assessments and risk analysis to identify the areas most vulnerable to attacks.[104] The First Responders Report added that these assessments should be based on population, population density, vulnerability assessment, and critical infrastructure.[105] To streamline the funding process and ensure that funding is distributed as quickly as possible to facilitate timely purchases of updated and improved equipment, the First Responders Report recommended that homeland security grant programs be reevaluated to reduce redundant programs; that states should create a list of priorities so that federal funding is spent in areas that need funding the most; and that all appropriations bills in Congress should include strict timelines for distribution of funds.[106] Additionally, Congress should provide emergency responder grants that are multi-layered to ensure long-term training and planning initiatives.[107]

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[102] Rudman, p. 32.
[103] *Ibid*., p. 19.
[104] *9/11 Commission Report*, p. 396.
[105] Rudman, p. 5.
[106] *Ibid*., p. 5.
[107] *Ibid*., p. 4.

To assist state and local emergency response agencies in determining roles, responsibilities, and objectives in an emergency situation, the First Responders Report recommended that the DHS and Department of Health and Human Services work with these agencies to establish standards and guidelines for emergency preparedness.[108] Additionally, the Report called for establishment of a "National Institute for Best Practices in Emergency Preparedness" within DHS to disseminate best practices and lessons learned to first responders.[109] A GAO Report found that there needed to be a clear definition of roles and responsibilities between federal, state, and local authorities for emergency preparedness and response.[110]

The private sector

Recommendations for the reports focused on developing standards for the private sector so that they implement effective emergency response plans, fostering public-private partnerships, and creating incentives for the private sector to support first responder communications systems.

The main recommendation that the 9/11 Commission made for the private sector was that it adopt the American National Standards Institute's suggested standard for private sector preparedness. The Commission went on to say that private sector preparedness "is not a luxury; it is a cost of doing business in the post-9/11 world. It is ignored at a tremendous potential cost in lives, money, and national

[108] *Ibid*., p. 16.
[109] *Ibid*., p. 4.
[110] Dalton, p. 2.

security."[111] Delineating the role of private first responder companies in a large-scale emergency is also an important part of effective emergency response planning.

The CFR Report focused more on the political barriers to creating public-private partnerships that would facilitate more effective emergency preparedness. One strategy the Report proposed to increase information sharing was to invite private sector experts to conduct vulnerability assessments and participate in training activities and exercises.[112] Additionally, reducing the legal constraints that the private sector must operate within when dealing with the federal government and access to information will facilitate these partnerships.[113] Specifically, the Report recommended creating a "fast track" security clearance system for appropriate private sector leaders, lenient antitrust laws, and Freedom of Information Act exemptions.

One last recommendation that the McKinsey Report offered was that the private sector should assist with obtaining and installing communications systems that would support first responder communications equipment, such as repeater systems.[114]

Summary

Following the attacks of 9/11, many articles, reports, and books were published that highlighted areas of vulnerability and proposed ways to improve emergency management practices in large-scale disasters. Those proposals included: providing better equipment and training to first responders; establishing clear SOPs (including roles and responsibilities) for the private sector and at the local, state, and

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[111] *9/11 Commission*, p. 398.
[112] Hart, p. 33.
[113] *Ibid*., p. 34.
[114] McKinsey Report, p. 91.

federal levels; and facilitating extensive coordination among different agencies, jurisdictions, and organizations in the private sector.

Most of these recommendations came to light before the Northeast Blackout of 2003. Chapter Two analyzes the lessons learned from this incident, the vulnerabilities that contributed to the flawed response to this emergency, and recommendations for future disasters. This analysis helps to determine the extent to which recommendations from the response to 9/11 were implemented in emergency management plans within first responder agencies, the federal government, and the private sector.

CHAPTER TWO

THE NORTHEAST BLACKOUT OF 2003: CHALLENGES REMAIN, SOME OLD, SOME NEW

On August 14, 2003, the United States experienced one of the most extensive blackouts in history, with power outages in eight Northeast states. Areas of Canada were also involved. Overall, an estimated fifty million people were affected.[115] Although the power failure was not the act of terrorists, many security experts such as Stephen Flynn and Richard Clarke have postulated that an attack on critical infrastructure (such as the power grid) is a likely terrorist event. For this reason, lessons from the blackout must be analyzed to determine how to prepare for another attack on our critical infrastructure and in turn enhance our homeland security policies.

The first part of this chapter focuses on the response to the blackout in terms of the transportation sector, health care providers, emergency operations personnel and essential staff, the private sector, and communications. The lessons of the terrorist attacks of 9/11 prompted first responders, government agencies, and the private sector in New York City to increase their emergency preparedness, which helped in the response to the blackout.

The second part of the chapter analyzes the areas where improvements were made. While there were steps taken to ensure a more effective response to a large-

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[115] Joint Hearing of the Subcommittee on Cybersecurity, Science, and Research and Development and the Subcommittee on Infrastructure and Border Security of the Select Committee on Homeland Security, "Implications of Power Blackouts for the Nation's Cybersecurity and Critical Infrastructure Protection," (Washington, DC: U.S. Government Printing Office, September 2003), p. 44.

scale emergency, vulnerabilities still existed that hampered the response to the blackout. The third part of the chapter focuses on those vulnerabilities.

The chapter concludes with analysis of the recommendations made in the aftermath of the blackout to further improve emergency response. Recommendations are focused on the transportation sector, health care providers, emergency operations centers, and the private sector, with emphasis on standard operating procedures, communications, and interagency coordination.

Various reports were published that highlighted lessons of the blackout and recommended improvements in emergency response efforts. The three main reports include: a report to New York City Mayor Michael Bloomberg from the New York City Emergency Response Task Force, *Enhancing New York City's Emergency Preparedness*; a report by the U.S. Department of Transportation, *Effects of Catastrophic Events on Transportation System Management and Operations: New York City*; and an article in the Association of Schools of Public Health, "Blackout of 2003: Public Health Effects and Emergency Response." Other sources include: a document entitled "Transit Security Design Considerations," sponsored by the U.S. Department of Transportation; an article in *Public Roads* entitled "Learning from the 2003 Blackout"; and testimony of the Greater New York Hospital Association. In referring to the findings and recommendations of these various sources, the following designations will be used: "Preparedness Report" for *Enhancing New York City's Emergency Preparedness*, "Transportation Report" for *Effects of Catastrophic Events on Transportation System Management and Operations: New York City*, "Public Health Report" for "Blackout of 2003: Public Health Effects and Emergency

Response," "Public Roads Report" for "Learning from the 2003 Blackout," and "Hospital Report" for the testimony of the Greater New York Hospital Association.

Lessons for Domestic Security from the Northeast Blackout of 2003

Some of the proposals for change in reports following the 9/11 attacks had been implemented by 2003. They enabled New York City to better handle the domestic security problems posed by the massive blackout. In addition, some of the problems that existed on 9/11 were resolved in the response to the Blackout. However, new problems emerged that had not previously been exposed. They provided new lessons to further develop and improve emergency management practices in transportation, health care, emergency operations centers, the private sector, and communications infrastructure.

Transportation

One of the most significant issues that plagued response efforts during the Blackout was the overwhelming volume of pedestrians, both New York residents and commuters from New Jersey, Connecticut, and other areas outside the city. There were an estimated 2 million people in the city every day, and their exodus into the streets at the end of the workday on August 14, 2003 hampered response efforts.[116] Since public transportation was not operating due to the Blackout, there was heavy pedestrian traffic in the streets and on bridges, which slowed emergency vehicles from responding to incidents.

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[116] U.S. Department of Transportation, Federal Highway Administration, *Managing Pedestrians During Evacuation of Metropolitan Areas*, http://ops.fhwa.dot.gov/publications/pedevac/2_literature.htm#2.5.5 (March 2007).

The first lesson from the Blackout was that better evacuation plans and routes needed to be established. This would not only help people get out of the city but would also help emergency vehicles in their response efforts and allow organizations and agencies providing assistance to transport resources and personnel.[117]

The second lesson was that better SOPs for methods of transportation needed to be established so that all transportation agencies would have the same regulations in place during an emergency. For example, some bus companies and ferry companies stopped charging fares, while others continued to do so.[118] Standardizing these procedures would contribute to a more efficient evacuation.

The third lesson was that a more effective system should be in place to manage traffic signals that lose their power source. The lack of functioning traffic lights led to more congested streets and created difficulties for emergency vehicles.[119] This problem was exacerbated by the fact that none of the traffic signals had backup battery power. While during the blackout civilians frequently took the initiative to direct traffic,[120] they cannot be relied upon to do so in a large-scale emergency, especially in the event of a terrorist attack.

The fourth lesson from the Blackout was that a more effective way to communicate with the public about transportation hubs should be established.[121] Many pedestrians were not aware of the locations from which buses were departing or what alternate methods of transportation were available. Ensuring a better way to

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[117] Allan J. DeBlasio, Terrance J. Regan, Margaret E. Zirker, Katherine S. Fichter, Kristin Lovejoy, *Effects of Catastrophic Events on Transportation System Management and Operations* (Cambridge, Massachusetts: April 2004), p. 20.
[118] DeBlasio, p. 25.
[119] Joint Hearing, p. 200.
[120] DeBlasio, p. 11.
[121] *Ibid*., p. 19.

disseminate this type of information would ease congestion and facilitate evacuation efforts.

The last lesson of the Blackout was that traffic emergency operations centers needed to be better prepared to manage an emergency situation. For example, emergency food and water supplies need to be available so that traffic personnel can work long hours. Flashlights with updated batteries should be on hand so that when lights fail, traffic personnel can see down stairwells and other areas where light sources are not backed up with a generator, and charged batteries should be accessible for cell phones and other electronic devices.[122]

Health

During the Blackout, hospitals ran generators to carry on operations. Some generators did not perform as expected, which illustrated the importance of: health care facilities having adequate fuel to run their generators; properly maintaining mechanical parts of generators; and testing them regularly under a full load to ensure that they would function at full capacity in the event of an outage.

Ensuring that facilities that can be used to sterilize equipment and keep vaccinations and other medical supplies from spoiling are accessible during a blackout is imperative to maintain essential hospital functions and services.[123] An additional important lesson was that facilities need to be in place to assist patients with non-emergency services in the event of an extensive power outage so that hospitals and other health care facilities are not overwhelmed but rather can focus their attention on patients in need of urgent medical care.

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[122] *Ibid*., p. 21.
[123] Beatty, p. 39.

During emergencies, hospitals use a syndromic surveillance system to track patient symptoms in order to determine if an infectious agent has been released by terrorists. That system was unable to transfer important information to the Department of Health and Mental Hygiene during the Blackout. The data that this system creates is only a helpful tool in emergency response efforts if it can be shared with key agencies and departments. The Blackout demonstrated how vulnerable parts of this system are to failure. Moreover, it showed how imperative it is to ensure that all components of the syndromic surveillance system are supported by backup power sources so that emergency responders and personnel can act on accurate information in a timely manner.

Emergency operations center

Among the variety of command centers established to make policy decisions during an emergency (such as tactical command centers that manage emergency operations in coordination with first responder agencies, or the command center that the mayor and key political staff establish to make important policy decisions) the most important command center is the Emergency Operations Center (EOC). During the Blackout, the EOC was organized by the New York City Office of Emergency Management. Problems with that center indicated that EOC personnel and staff needed to better prepare for emergencies, especially those where power sources are compromised, in order to function at full capacity during an incident.[124]

[124] New York City Emergency Response Task Force, p. 8.

Communications

The first lesson of the blackout was that better communication technology and systems need to be available to personnel. In particular, traffic personnel must have reliable communications infrastructure in the event that large-scale evacuations are necessary. Additionally, since traffic personnel are so often out in the field, improved ability to communicate could facilitate a smoother evacuation process.[125]

The second lesson was that a more effective technology infrastructure for emergency dispatchers was needed. The emergency dispatch and communication system failed several times during the Blackout and was overwhelmed with 911 calls, which indicated the pressing need to implement better systems so that first responders can receive information and respond quickly to emergency calls.

In addition to providing better communications systems for first responders and necessary personnel, the crisis also demonstrated the need for a better backup system for public telecommunications facilities. During the Blackout, citizens had difficulties placing calls, including 911 calls, because a Verizon facility was affected by the Blackout. Since emergency management personnel also rely on cellular communications through private companies,[126] ensuring that telecommunications companies have sufficient backup power is imperative.[127]

Private sector

As mentioned earlier, the private sector owns and operates 85% of critical infrastructure in the U.S. The Blackout was an illustrative event in that it

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[125] DeBlasio, p. 39.
[126] Joint Hearing, p. 200.
[127] New York City Emergency Response Task Force, p. 11.

demonstrated how salient is role of the private sector in homeland security. If the private sector does not do more to increase its ability to withstand an attack, whether an attack on physical infrastructure or a cyber attack, it will be increasingly vulnerable to terrorists.[128]

Terrorists, however, are the not the only thing that can affect critical infrastructure. Human error, as was evidenced by the Blackout, and severe weather events can also have disastrous impacts on critical infrastructure. Resiliency, or the ability of the private sector to recover from large-scale failures, is paramount to ensuring long-term sustainability of our critical infrastructure.

In addition to these lessons for the private sector, it was also apparent in the aftermath of the Blackout that the government needs to collaborate with the private sector.[129] Since the private sector is primarily motivated by economic concern for the bottom line, the government must find a way to pressure the private sector to invest in critical infrastructure protection, by creating incentives and mandating higher government standards.[130]

Areas of Improvement

The lessons learned from 9/11 led to a very different outcome for first responders during the Northeast Blackout of 2003. Their efforts were largely successful, avoiding the extensive confusion and chaos that characterized the response to 9/11.[131,132] Other organizations were also able to learn from some of the

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[128] Joint Hearing, p. 222.
[129] *Ibid*., p. 122.
[130] *Ibid*., p. 17.
[131] International Association of Fire Chiefs Report, "Performance of the Fire Service during the 2003 Northeast Blackout and the Implications for Critical Infrastructure Protection," (Fairfax, VA: November 2003), p. 1.

lessons of 9/11, which contributed to a more efficient and effective response to the Blackout.

Standard operating procedures

As a result of 9/11, several SOPs were established prior to the Blackout. For example, the staff at INFORM (INformation FOR Motorists) developed emergency operations plans in collaboration with other agencies, including the New York Department of Transportation Headquarters, Federal Highway Administration, and the Transportation Operations Coordinating Committee. These emergency management plans had previously been activated during a hurricane, a major athletic event, and several practice drills, which contributed to their successful implementation during the Blackout.[133]

Emergency operating procedures that had been established after 9/11 for traffic patterns were also initiated during the Blackout. When the Blackout occurred, these procedures helped control the flow of vehicles into Manhattan by closing bridges and tunnels or restricting what vehicles could pass through. This prevented even more motorists from adding to Manhattan's serious traffic congestion.[134]

Procedures had also been established for the roles and responsibilities of specific personnel. For example, managers from the Port Authority of New York and New Jersey reported to their respective emergency operations centers without being told because they were familiar with emergency procedures, and employees knew ahead of time who was responsible for opening an emergency operations center.

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[132] New York City Emergency Response Task Force, p. 1.
[133] DeBlasio, p. 19.
[134] *Ibid*., p. 12.

Similarly, NYPD police officers in the traffic division knew the intersections to which they should report in the event of an emergency.[135] To aid emergency personnel in their response efforts, a 1-800 number had been created by NJ Transit and TRANSCOM so that key staff could pass on details of agency response plans and hold conference calls.[136,137]

The Department of Health and Mental Hygiene enhanced its emergency management practices following the events of 9/11 by implementing the Incident Management System. This assisted with the Department's response to the Blackout, as it facilitated effective communication, a unified command structure, and standardized procedures and terminology.[138]

Mutual-aid agreements had also been established by the Public Health Laboratory so that in the event of an emergency the Public Health Laboratory could rely on other laboratories when it needed additional assistance to carry out essential functions. When some of the equipment failed to operate during the Blackout, the Laboratory was able to enlist the help of other laboratories that had agreed to provide backup assistance in advance.[139]

Interagency coordination

One of the most serious problems that plagued response efforts to the 9/11 attacks was the lack of interagency coordination. In the years following 9/11,

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[135] *Ibid*., p. 17.
[136] Matthew Rabkin, Robert Brodesky, et al. "Transit Security Design Considerations" U.S. Department of Transportation, Appendix G "Lessons Learned from Transit Communications Emergencies," (Cambridge, MA: November 2004).
[137] DeBlasio, p. 21.
[138] Beatty, p. 43.
[139] *Ibid*., pp. 40-41.

interagency coordination improved greatly between various agencies in New York City. It was facilitated by day-to-day operations, joint terrorism exercises, and other large-scale emergencies.[140]

Transportation agencies in particular became familiar with one another and developed relationships, which contributed substantially to the response efforts during the Blackout. Since many of the transportation services crossed city and state boundaries, there was an extensive amount of regional collaboration, such as the efforts between the NYC MTA Bridges and Tunnels staff and the NYC Transit staff to evacuate citizens.[141]

In addition, transportation agencies also reached out to other agencies that supported response efforts. For example, transportation agencies had previously established agreements with private carrier companies, which were activated during the Blackout.[142] Transportation departments also worked closely with emergency operations centers at the local and state level, and coordinated with law enforcement agencies, especially state and transit police forces.[143]

Interagency coordination occurred on both the individual and institutional levels.[144] Through day-to-day operations and exercises, personal relationships were established. This made things easier when additional resources were needed because someone knew exactly whom to contact in another department to obtain those resources.[145]

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[140] DeBlasio, p. 22.
[141] *Ibid*., p. 22.
[142] *Ibid*., p. 24.
[143] *Ibid*., p. 23.
[144] *Ibid*., p. 38.
[145] *Ibid*., p. 23.

Some interagency coordination has gone beyond public government agencies, expanding into the private and non-profit sector. For example, the Greater New York Hospital Association established an Emergency Preparedness Coordinating Council in the months after 9/11 to coordinate with local and regional agencies and service providers to facilitate emergency planning.[146]

Training and Exercises

Interagency coordination was facilitated through various interactions, including tabletop* and joint-terrorism exercises and training sessions. Training, exercises, and real-life scenarios also contributed to preparedness initiatives, ensuring that first responders and emergency personnel knew what to do and how to perform their responsibilities during a large-scale emergency, and demonstrated areas that needed to be improved.[147]

Since one of the lessons that emerged from the response to 9/11 was that the Incident Command System needed to be integrated into response efforts, the NJ Transit staff was trained in ICS during a train derailment.[148] Tabletop exercises have also been valuable in developing best practices for emergency management. Some of the tabletop exercises were small and local in scope, while others expanded across national borders and involved many different agencies.[149]

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[146] Susan C. Waltman, "Testimony of the Greater New York Hospital Association on New York City Hospitals in the Blackout of 2003: Lessons Learned at a Public Hearing before the New York City Council Committee on Health," (New York City: September 29, 2003), p. 4.
[147] DeBlasio, p. 22.
[148] *Ibid*., p. 18.
[149] *Ibid*., p. 18.
*Tabletop exercises are group discussions or brainstorming sessions centered on a simulated emergency situation.

Another important component of emergency preparedness is training. In the aftermath of 9/11, emergency management personnel, particularly those with transit agencies, received training so that they could perform their own jobs better in an emergency situation, and they were also cross-trained so that they could perform other employees' jobs when the need arose. Moreover, transit managers who are often in the field in an emergency received training so that they would be more effective decision makers in the event that communications technology was not functioning.[150]

Employees with the Department of Health and Mental Hygiene participated in training and exercises to increase familiarity with the Incident Management System. This training helped them to understand what their role and section assignments would be in the event of an emergency.[151] In addition, several agencies had run drills and participated in exercises to become more familiar with their emergency response plans so that evacuations and procedures were carried out effectively during an actual emergency.[152]

Areas of Vulnerability

New York City had experienced other outages in the past, most notably in 1965 and 1977. However, it had been a while since the city had to deal with an outage as extensive and long-lasting as the Northeast Blackout of 2003. For this reason, many of the systems that had not previously been fully tested were found to be insufficient in a blackout that lasted more than a few hours.

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[150] *Ibid*., p. 18.
[151] Beatty, p. 38.
[152] DeBlasio, p. 38.

Transportation

The New York City transportation system is one of the most extensive and most heavily traveled in the United States.[153] In particular, the subway system is the largest, most complex system in the country.[154] While the evacuation of the more than 400,000 subway riders[155] was relatively smooth, problems occurred when those passengers needed other methods of transportation to reach their destinations.

The two forms of public transportation that were not affected by the Blackout experienced their own difficulties. The ferry system that connects Manhattan to ports in New Jersey and Brooklyn was overwhelmed with travelers on both the piers and the ferries themselves.[156] Ferry services and some bus carriers lacked standardized regulations for what fares would be collected or what passes would be honored in an emergency situation.[157] Bus services were overwhelmed as well by the unexpected influx of passengers who normally traveled by train daily as well as by people who had no other means of transportation. Buses experienced additional problems because the traffic congestion was so extensive. Problems were made worse by the failure of communications systems, which left the transit operations center to be unable to communicate directly with individual buses.[158]

These overcrowding problems were exacerbated by the lack of an effective means to communicate transportation information to travelers. Public address systems to notify travelers of transportation options were in the buildings that had

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[153] *Ibid*., p. 6.
[154] *Ibid*.
[155] *Ibid*., p. 8.
[156] *Ibid*., p. 14
[157] *Ibid*., p. 25.
[158] *Ibid*., p. 13.

been evacuated,[159] and there were no other public address systems in place to disseminate accurate transportation information.

Health

While all hospitals had generators, a few hospitals did not have a backup power source at the onset of the Blackout because their generators did not perform as expected during the blackout. Additionally, some generators began to run low on fuel or experienced issues with mechanical equipment.[160]

During the Blackout it became apparent that patients who relied on electricity to power medical equipment needed a source of energy; in many cases these patients went to local hospitals in hopes that they would be able to provide some source of power.[161] Hospitals and health care facilities were overwhelmed with these patients, as well as with patients who needed other non-emergency services, such as those needing prescriptions to be filled or those simply seeking shelter.[162]

The Blackout caused some breakdowns in the syndromic surveillance system that hospitals employed to track symptoms of patients to determine if an infectious agent had been released by terrorists. While the main equipment functioned properly because it was backed up by generators, the system that transferred the data to other hospitals and the Department of Health and Mental Hygiene was not supported by the generator. The information had to be collected manually and transmitted by

[159] *Ibid*., p. 30.
[160] Waltman, p. 5.
[161] Beatty, p. 43.
[162] New York City Emergency Response Task Force, p. 14.

emergency personnel.[163] This system was inefficient and would have proven disastrous if a terrorist attack had in fact occurred.

Communications

Improving communications technology across all agencies was not a widespread initiative in the aftermath of 9/11; therefore, transportation agencies lacked sufficient communications abilities. While older communications systems (such as fax machines and landlines) worked in operations centers,[164] many of the transit personnel who worked in the field could only use hand-held walkie-talkies, which only worked as long as their batteries lasted.[165]

Transportation agencies were not the only agencies that experienced difficulties with communication equipment. While many agencies had developed emergency operations plans in the wake of 9/11, communications technology either failed or was not sustained long enough by battery power, hampering emergency response procedures.

First responders again had to manage the crisis despite failed communications infrastructure. The 911 system did not work as intended because the telephone company had lost power. Similarly, the FDNY could not operate its computerized tracking systems, so fire and EMS personnel had to be tracked manually.[166]

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[163] Beatty, p. 40.
[164] DeBlasio, p. 21.
[165] Allan J. DeBlasio, Terrance J. Regan, Margaret E. Zirker, Kristin Lovejoy, Katherine S. Fichter, "Learning from the 2003 Blackout", *Public Roads*, Vol. 68, No. 2 (September/October 2004). *Designated herein as DeBlasio (II).
[166] Joint Hearing, p. 14.

Furthermore, repeaters* could not function without a power system.[167] Since there were no backup energy sources for these systems, or the batteries on which they relied did not last for the duration of the outage, the efforts of first responders and other emergency personnel were hampered.

Despite recommendations following 9/11 for improved communications abilities for first responders, including an increased bandwidth and interoperability of communications systems, those recommendations had not been implemented and caused problems for first responders during the Blackout. While improved, communications between local, state, and federal agencies still encountered some difficulties, as well.[168]

Although some agencies had predetermined roles and responsibilities for personnel in emergency situations, not all agencies had such procedures in place. For instance, instead of having emergency operations procedures, the Department of Health and Mental Hygiene relied on its call center for employees to obtain important information about the situation and their responsibilities. Since the backup battery the call center used during outages was unable to maintain continuous backup power, the call center was not an effective means of communicating with employees. Additionally, the call center could not deal with the volume of calls it received because there were not enough landlines.[169]

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[167] Rabkin, Appendix G.
[168] Joint Hearing, p. 117.
[169] Beatty, p. 41.
*As noted in Chapter One, repeaters are systems that facilitate radio communications by transmitting signals over a wider area.

Standard operating procedures

While most agencies had emergency operations plans, some of them did not have plans that were fully developed, effective for a long-lasting blackout situation, or put into practice through drills and exercises. This led to confusion over staff responsibilities during an incident since emergency personnel did not have predetermined roles. For example, the EOC was not always sufficiently staffed, and the staff was not entirely familiar with emergency operations plans or other agencies. This was exacerbated by employees lacking official credentials, which slowed their ability to respond to an incident. Additionally, command structures during the Blackout were not consistent, which caused information to be duplicated or not to be shared with staff who had to make important decisions that relied on accurate information.[170]

Although more integrated emergency dispatch systems were recommended in the wake of 9/11, the City of New York had failed to address this issue. Instead, fire, police, and EMS agencies followed separate protocols for 911 calls, which led to a more inefficient system to responding to calls for assistance.[171] A more effective system for coordinating with each of the first responder agencies would facilitate more efficient response efforts.

Recommendations

Some of the recommendations after the Blackout had previously been made in the wake of 9/11. Most of the recommendations, however, were new in scope, not having been raised by key 9/11 reports. While the Preparedness Report is the main

[170] New York City Emergency Response Task Force, p. 8.
[171] *Ibid*., p. 9.

focus of this section because it focused entirely on recommendations, other reports provided recommendations that were either put forth in the Preparedness Report or were original recommendations, and therefore will be included when necessary.

Transportation

The Preparedness Report offered several key recommendations for the transportation sector. The first was that a more effective, efficient, and flexible transportation plan should be established and distributed more widely to the public. The plan should include specific regulations for pedestrians to facilitate the movement of emergency vehicles. The Report suggested that this plan also include standardized, citywide protocols for collecting fares and honoring transit passes.[172]

In order to solve the overcrowding problem that occurred at many ferry docks and piers, the Preparedness Report recommended that New York City explore options for augmenting ferry services in the event of an emergency, and that any issues that arose with specific carriers or pier locations be resolved. In order to achieve this, New York City should also create an inventory of all ferry resources that would be accessible during an incident, and should ensure that enough public safety personnel would be available to perform crowd control and maintain order.[173]

One of the main issues during the Blackout was the failure of traffic signals to operate, causing congestion and delaying emergency response vehicles. The Preparedness Report recommended a few solutions. One was to install backup power sources, particularly at critical intersections, including batteries, generators, or solar panels. The second was to implement laws that require travelers to stop at all

[172] *Ibid*., p. 21.
[173] *Ibid*.

intersections when the signals were not functioning due to a power outage. The third proposal was to train people, either municipal employees or citizens, to direct traffic in the event that police officers were not able to perform their usual traffic duties.[174] To ensure that these signal systems can withstand a blackout, the Transportation Report recommended that city agencies take backup power and restoration needs of traffic signal equipment into consideration before investing in this equipment.[175]

To facilitate evacuation efforts, the Preparedness Report recommended that transportation centers should be identified so that citizens can find them and get accurate information about the means of transportation that are operating in an emergency situation. The Report also recommended that New York City reach out to private carriers, such as taxis, limousines, and buses to plan for emergencies and determine how these companies can assist in an incident.[176]

The Hospital Report recommended that transportation policies include provisions for health care personnel. This Report highlighted the importance of considering personnel from hospitals and nursing homes essential staff so that they can be included in certain citywide procedures and have access to transportation in the event of an emergency.[177]

Health

Mass care facilities, such as hospitals and nursing homes, must sustain operations in an emergency situation to treat urgent medical needs. During the Blackout, some hospitals ran into difficulties with generators malfunctioning or had

[174] *Ibid*.
[175] DeBlasio, p. 39.
[176] New York City Emergency Response Task Force, p. 22.
[177] Waltman, p. 10.

concerns about fuel levels to power the generators. Therefore, the Preparedness Report recommended that standards for hospital generators be assessed and upgraded to ensure that hospitals can provide services (at full load capacity) through long-lasting, extensive power outages. Other essential care facilities, such as dialysis centers and blood banks, should also have sufficient backup power in place to support them during outages. Further, the Report emphasized the need have emergency preparedness plans at care facilities, including adult homes and assisted living centers.[178]

Since hospitals and other medical facilities were overwhelmed with patients who needed non-emergency medical care or a power source for their medical equipment, the Preparedness Report proposed working with the private sector to establish comfort centers. If agreements are made with the private sector to provide comfort centers that would help people with non-life threatening medical concerns, it would alleviate the pressure on hospitals freeing them from responding to less serious cases in order to focus on emergency conditions.[179] The Hospital Report suggested that the city of New York provide these alternative care sites and shelters in future incidents to ease the demand on hospitals.

To ensure that vulnerable populations, such as the elderly, homebound, or disabled are cared for in an emergency, the Report suggested that the 311 telephone number of the Citizen Service Center could be utilized to respond to calls from people needing non-emergency assistance. Additionally, outreach efforts should be continued to encourage citizens, especially vulnerable populations, to create

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[178] New York City Emergency Response Task Force, p. 22.
[179] *Ibid*., p. 23.

individual emergency preparedness plans, which could include contact information of individuals who could provide assistance to people with special needs, and plans to have backup supplies, such as medications, food, and water, on hand for emergency situations.[180]

While fortunately the Blackout did not last long enough to cause significant problems of getting water for residents of high-rise buildings, a longer incident would have required a system for distributing water to people stuck in apartment buildings. The Report suggested that plans for delivering water in such a situation should be evaluated and improved.[181]

Emergency operations centers and city agencies

The Preparedness Report focused on ways to improve emergency operations and EOCs. The first recommendation was to develop a more effective command structure to ensure that appropriate personnel are determined before an incident to lead emergency management operations. This structure should include a way for EOCs to contact staff designated to lead in an incident, and procedures for how those commanders will respond in an emergency. Establishing this structure will also help in obtaining resources to respond to an incident, including equipment and supplies to support the commanding officer's decisions.

The second recommendation offered by the Preparedness Report to enhance EOC capabilities was that essential emergency staff should have predetermined roles and responsibilities so they know how to respond in an emergency. Standard operating procedures should be developed to designate certain staff for key operating

[180] *Ibid*.
[181] *Ibid*.

functions, such as information technology or facilities management, to ensure that normal functions continue smoothly. Moreover, these plans should be reinforced by training, drills, and exercises so that in a real emergency, personnel are familiar with any self-activating emergency plans and know what is expected of them.

The Preparedness Report also recommended that a process for providing credentials to essential staff must be implemented. A system should also be developed that keeps a directory of essential staff, how they can be identified, and would include their credentials so that they could be allowed into an incident area and provide services. In addition, a system to determine which staff would be best suited to respond during a particular disaster based on skill sets and abilities should be used in assigning response duties. This system should include both essential and non-essential emergency personnel. Emergency operations centers should also have a directory of all personnel and ways to contact them in the event of an emergency.[182]

Some of the recommendations provided in the Public Health Report reflected those that were given in the Preparedness Report. One such recommendation was that emergency protocols for city personnel be predetermined, including which employees should report to work, when and in what situations they should report, and where or to whom they should report. In order to further enhance emergency operations, each city agency should have a secure and easily accessible directory of employees, along with contact information and each of the employee's skill sets. To ensure that these procedures work seamlessly in an emergency and that employees

[182] *Ibid*., pp. 16-17.

understand what is expected of them in an incident, the Public Health Report also recommended that drills, exercises, and trainings be carried out and evaluated.[183]

The Transportation Report recommended that EOCs have sufficient supplies so that EOCs can operate during an emergency.[184] These resources include supplies of water, power bars, and batteries to sustain personnel and emergency operations, and also generators, machinery, light towers, and fuel to assist other agencies and facilities, such as hospitals in their emergency response efforts. The Public Health Report recommended further that these supplies be kept in a place that is accessible in an emergency, rather than a facility that is difficult to access or far away.[185] Procedures for sharing these resources with other agencies and neighboring jurisdictions should also be established.[186] Furthermore, the Preparedness Report recommended that EOCs have a system in place that tracks the supply of these resources.[187]

The Public Roads Report emphasized the need for emergency operations centers and other city agencies to invest in initiatives that enhance redundancy. The Report specified that agency personnel, communications, utilities, and control centers all have redundancy built into them. Additionally, backup power should be available for things such as key door entry systems, air conditioning equipment, building

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[183] Beatty, p. 41.
[184] DeBlasio, p. 37.
[185] Beatty, p. 43.
[186] DeBlasio, p. 37.
[187] New York City Emergency Response Task Force, p. 17.

security systems, and sump pumps for areas that are prone to flooding, among others.[188]

Standard operating procedures

While most agencies had emergency operations and evacuations plans in place before the Blackout, several had not established such procedures. The Preparedness Report advised that all city agencies should have emergency and evacuation plans in place, and that drills and exercises should be carried out to test their effectiveness and ensure that employees are familiar with the plans. Considerations the Report suggested agencies should keep in mind included shelter-in-place procedures, how disabled employees or other vulnerable populations will be evacuated in an incident, and what methods of transportation will be utilized in the event of an evacuation.[189]

The Transportation Report recommended that these plans should also include procedures in the event that an incident out lasts capabilities of backup power sources.[190] Additionally, the Report recommended that plans be created that have procedures for recovery efforts after incidents occur.[191]

The Preparedness Report suggested that procedures for communicating with telecommunications providers during an incident be formalized, including notification when incidents occur and maintaining open lines of communication with city agencies during an emergency.[192]

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[188] DeBlasio (II).
[189] New York City Emergency Response Task Force, p. 18.
[190] DeBlasio, p. 41.
[191] *Ibid*., p. 37.
[192] New York City Emergency Response Task Force, p. 20.

Communications

The Preparedness Report recommended that the 911 system be assessed to identify areas of vulnerability. Specifically, single points of failure should be addressed so that emergency communications between the public and first responder agencies can be maintained in a large-scale outage. Moreover, dispatch and emergency communications systems should be assessed to determine how they can better facilitate incident command and centralized communications that coordinate the various emergency services agencies.[193] The Report continued on to note the importance of incorporating systems that allow emergency dispatchers to track emergency vehicles and therefore assist with allocating resources and personnel.[194]

So that telecommunications services continue in the event of a power outage, the Public Roads Report recommended that New York City, its emergency response agencies, and private sector entities related to homeland security issues or emergency management join the federally funded Government Emergency Telecommunications Service and Wireless Priority Service so that pre-approved users are prioritized in an incident. These systems operate even under periods of high demand and can support both landline and wireless calls.[195]

In order to facilitate sharing important information with the public in emergency situations, the Preparedness Report recommended that the New York City Hall press office centralize communications to the public, rather than the Office of Emergency Management handling this responsibility. Additionally, the Report noted the communications systems that are already in place, such as the 311 Citizen Service

[193] *Ibid*., p. 19.
[194] *Ibid*., p. 20.
[195] DeBlasio (II).

Center, should be used to disseminate information to the public.[196] These systems, as the Report pointed out, would assist New York City in communicating with city employees as well as businesses.[197] To facilitate communications with the public in the event of a power outage, the Public Health Report suggested that press releases and public health advisories on basic health issues that are expected from certain types of emergencies be prepared ahead of time to avoid delays if computer systems are down.[198] The Transportation Report emphasized the importance of disseminating information to the public, and recommended that relationships with the media and other sources of information be established, in addition to communication procedures and strategies.[199]

The Transportation Report highlighted the importance of city agencies, especially transportation agencies, obtaining sufficient communications equipment and using up-to-date communications technology. Additionally, the Report recommended that agencies establish noncommunications (NonComm) plans* and perform exercises to identify weaknesses in NonComm plans.[200] The Public Roads Report echoed this recommendation, suggesting that personnel in emergency operations centers and other response agencies should have specific drills that test NonComm procedures.[201] The Transportation Report further recommended that agencies should have both older equipment, such as landlines, and newer communications technologies available for an emergency to ensure continued

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[196] New York City Emergency Response Task Force, p. 16.
[197] *Ibid*., p. 17.
[198] Beatty, p. 42.
[199] DeBlasio, p. 37.
[200] *Ibid*., p. 40.
[201] DeBlasio (II).

operation.[202] Lastly, agencies should have backup power for communications systems, such as batteries or generators.[203]

The Public Health Report recommended that the EOC in particular have better communications abilities by acquiring telephones that do not need additional power to operate so that lines of communication remain open and functioning.[204] The Hospital Report focused on having an effective communications system in place so that health information, such as locations of hospitals, shelters, and other care centers, could be disseminated to the public. This Report also emphasized the importance of informing the public not to go to hospitals unless they need urgent medical care.[205]

Infrastructure

One of the most pressing issues for emergency response operations during the Blackout was the need for backup energy sources. The Preparedness Report recommended that backup generators and batteries be maintained properly, which includes having adequate fuel reserves, and that new installations should abide by basic equipment standards. In addition, tests and evaluations of these backup energy sources should be performed regularly to ensure that they are able to withstand a full load in the event of a large-scale, long-lasting outage.[206] The Transportation Report recommended that city agencies have backup power sources at off-site facilities so

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[202] DeBlasio, p. 40.
[203] *Ibid*., p. 40.
[204] Beatty, p. 42.
[205] Waltman, p. 11.
[206] New York City Emergency Response Task Force, p. 17.
* Noncomm plans are developed to determine how communications will be carried out in the event that an extensive or pro-longed power outage occurs that impairs communications systems.

that in the event of an extended power outage or if other backup systems fail, operations can continue.[207]

Since there was such a large demand on fuel reserves to power different facilities and equipment during the Blackout, the Preparedness Report recommended that New York City update its fuel management plan. Revisions should take into account what agencies and facilities would be prioritized to receive fuel in an incident, as well as SOPs for working with multiple agencies and the private sector in delivering fuel supplies.[208] The Public Health Report recommended that the EOC in particular invest in measures that would ensure full capacity operations in the event of a long-lasting outage, including backup generators and batteries.

In order to ensure that critical services such as hospitals and nursing homes can continue to operate in the event of a power failure, the Hospital Report recommended that hospitals and other care facilities be given priority when power grids are being restored, rather than restoring them grid by grid.[209]

Interagency coordination

The Transportation Report recommended that city agencies establish formal agreements with other agencies and jurisdictions so that in an emergency situation clear chain-of-command structures and responsibilities for agencies and their employees are predetermined to enhance response efforts. Since command structures often differ between agencies and jurisdictions, ensuring that the same type of command structure is employed and identifying which personnel have authority

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[207] DeBlasio, p. 40.
[208] New York City Emergency Response Task Force, p. 18.
[209] Waltman, p. 9.

ahead of time will make emergency operations run more smoothly.[210] To facilitate this cooperation, the Report recommended that mutual aid agreements be created with neighboring jurisdictions and partner agencies.[211]

In addition to establishing formal cooperative relationships with agencies, the Transportation Report recommended that employees of city agencies develop personal relationships with their counterparts in other departments so that in the event of an emergency, employees know whom to contact in other agencies and jurisdictions to facilitate response efforts.[212] The last recommendation that the Transportation Report put forth was that emergency planning and cooperation efforts should have a regional component so that agencies and jurisdictions that do not often work together can operate seamlessly.[213]

The Preparedness Report proposed that traffic information be centralized into one Joint Traffic Operation Center. This way, all information would be in one place and the more than 20 agencies that coordinate traffic operations in the New York City metropolitan area would be able to easily locate important updates and would encourage information sharing and interagency coordination.[214]

Efforts to strengthen communications abilities should be coordinated at the city level so that resources are used more effectively and efforts are more consolidated. In evaluating citywide communications systems, the Preparedness Report recommended focusing on enhancing the citywide channels, installing backup

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[210] DeBlasio, p. 38.
[211] *Ibid*., p. 41.
[212] *Ibid*., p. 38.
[213] *Ibid*.
[214] New York City Emergency Response Task Force, p. 22.

power sources for repeaters, and expanding the radio spectrum to facilitate systems such as emergency vehicle location capabilities.[215]

To ensure that effective coordination continues, the Public Roads Report recommended that interagency coordination be assessed periodically, particularly after an incident occurs, to determine how relationships between organizations can be strengthened.[216]

Private sector

The Report advised that New York City should provide better information to business owners during an emergency. This process would be facilitated if representatives from the private sector were present at the EOC and therefore had direct access to important updates that they could then pass on to their private sector counterparts.

A second recommendation for the private sector that the Preparedness Report offered was that New York City should engage in more effective outreach efforts to get employees prepared to respond in an emergency. Most notably, the Report suggested that the City provide guidance on how employees can create an emergency kit and what supplies should be included.

To better facilitate evacuation efforts, the Preparedness Report suggested that commercial and residential buildings should be revised to reflect best practices. For example, buildings should have generators in the event that there is a power outage, sufficient lighting in stairwells, and systems to communicate with residents or employees during an outage.

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[215] *Ibid*., p. 20.
[216] DeBlasio (II).

Since a majority of the critical infrastructure in the U.S. is owned and operated by the private sector, it has an important role to play in ensuring that critical infrastructure is protected in an emergency situation and that it can recover quickly with little damage. The Preparedness Report singled out communications providers in its recommendations, advising that companies such as Verizon evaluate their backup power capabilities. Companies that provide communications services to emergency operations personnel or agencies were also identified in the Report as companies that should assess generators and batteries to ensure that systems will continue to operate in a power failure.[217] In order to facilitate maintaining emergency communications capabilities during an incident, the Report suggested using public-private initiatives, particularly with smaller communications companies.[218]

Summary

Even though the Northeast Blackout of 2003 was not an act of terrorism, it illustrated ways in which the U.S. would be vulnerable to a terrorist attack of this type. While the response to the Blackout improved in some of the areas that experienced problems in the response to 9/11, new vulnerabilities impacted response efforts. Additionally, while the terrorist attacks of 2001 were a significant event and caused many issues, this chapter has shown how, in many ways, the Blackout was a more complex incident. The next chapter will take the lessons from 9/11 and the blackout to determine how much Connecticut has improved its emergency management practices.

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[217] New York City Emergency Response Task Force, p. 18.
[218] *Ibid*., p. 20.

CHAPTER THREE

CONNECTICUT: READY FOR A LARGE-SCALE EMERGENCY?

Officials responsible for emergency management or homeland security have learned a great deal from the terrorist attacks of September 11th and the Northeast Blackout of 2003. Nonetheless problems remain. A case study of an exercise in emergency management illustrates ways in which homeland security has improved and areas needing further work. This chapter analyzes the third simulated Top Officials exercise (TOPOFF) to determine how well the State of Connecticut has adopted recommendations for emergency management in the years following 9/11 and the Blackout. It identifies the areas of improvement and vulnerability in recent years in Connecticut, collected from a variety of sources, including several interviews with first responders. The chapter concludes with recommendations for enhancing emergency management.

TOPOFF 3

From April 4-8 2005, the TOPOFF 3 exercise was held in New London, Connecticut, two counties in New Jersey, and jurisdictions in Canada and the United Kingdom. TOPOFF exercises were mandated by Congress to occur every other year in different parts of the United States to test counter-terrorism preparedness and response efforts and gain meaningful insight into where vulnerabilities exist.[219] The

[219] University of Connecticut College of Continuing Studies, Homeland Security Education Center, *State of Connecticut TOPOFF 3 After-Action Report, Summary of Key Findings* (January 2006) p. 4.

overall exercise involved more than 10,000 participants from more than 200 agencies at the federal, state, local, and tribal levels, in addition to international and volunteer organizations and representatives from the private sector[220]; the exercise in Connecticut alone involved more than 100 agencies, organizations, and localities.[221] The objective of this exercise was to evaluate the ability for these various agencies to effectively respond to two simultaneous terrorist attacks. The simulation's real-life components provided a way for the agencies to gain practical experience that was relevant to potential threats.[222]

The scenario in New London was a simulated attack involving the release of mustard gas and a high-yield explosive. The exercise included components from several of the National Planning Scenarios, including the blister agent scenario and the explosives attack-bombing using improvised explosive device scenario. The National Planning Scenarios were developed to assist local, state, and federal agencies in their preparation processes.[223] Many different agencies and organizations were involved in the exercise, including the U.S. Coast Guard, the Connecticut National Guard, the University of Connecticut, federal, state, and local agencies including local fire, law enforcement, and EMS, two tribal nations, local hospitals and health departments, and various private sector companies. The Department of Homeland Security's website provided this overview of the exercise:

> Over the course of several days fire personnel conducted search and rescue, hospitals treated the injured (played by role players), subject-matter

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[220] http://www.dhs.gov/files/training/editorial_0594.shtm
[221] University of Connecticut College of Continuing Studies, p. 3.
[222] http://www.dhs.gov/files/training/editorial_0594.shtm
[223] Department of Homeland Security, Office of Inspector General, *A Review of the Top Officials 3 Exercise* (November 2005) p. 6.

> experts analyzed the effects of the attack on public health, and top officials deployed resources and made the difficult decisions needed to save lives…An internal Virtual News Network (VNN) and news website provided real-time reporting of the story like an actual TV network would. The mock media kept players up-to-date on unfolding events and enabled decision makers to face the challenge of dealing with the real world media.[224]

Since so many organizations were involved in the planning and implementation process, many of which had different priorities or interests, this exercise served as a good test of their ability to communicate effectively and coordinate emergency response efforts. These agencies collaborated to establish seven overarching objectives for the exercise: examine interoperability of communications, examining State's incident management structure to determine the degree to which it follows the National Incident Management System; evaluate regional emergency response teams and procedures; test the ability of intelligence agencies to share information; examine the degree to which effective risk communication is carried out through interagency media and public information systems and procedures; assess the ability of the State's behavioral healthcare system to assist with psychological trauma and procedures in providing first aid assistance to victims needing crisis counseling; and evaluate continuity of operations plans for the private sector.[225]

UConn After-Action Report findings

The University of Connecticut (UConn) After-Action Report, published in January 2006, provided some insight into areas where vulnerabilities existed in the

[224] http://www.dhs.gov/files/training/editorial_0594.shtm
[225] University of Connecticut College of Continuing Studies, pp. 4, 11-14.

response efforts. In particular, it considered how to improve upon the objectives that had been previously determined for the exercise. Moreover, it provided recommendations to enhance response capabilities.

The first vulnerability the Report identified occurred in the area of incident management. During the exercise emergency response was hindered by confusion or which entity had authority: the Incident Command Center, the Joint Field Office*, or the State and Local Emergency Operations Centers. There was also confusion about how information should be shared among them. While the presence of liaison officers enhanced information sharing, the Report emphasized the importance of those officers having appropriate levels of clearance. The process to obtain clearance is often lengthy, and in the event of an emergency, the process should be streamlined so that local, state, and private sector representatives can have access to critical information that would facilitate more informed decision-making in an emergency. The Report also noted that it was crucial to have the private sector represented in the Incident Management System. To remedy the issues experienced with incident management, the Report recommended further drills, tabletop exercises, and training in NIMS, ICS, and the National Response Framework so that first responders, state and local officials, public health communities, and members of the private sector could better understand their roles and responsibilities in an emergency.[226]

Issues with information and intelligence sharing also came to light during the exercise. The Report recommended that communications technology in the Joint Field Office be improved and that the process for obtaining security clearances and

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[226] *Ibid*., p. 6.

*As noted in Chapter One, repeaters are systems that facilitate radio communications by transmitting signals over a wider area.

declassifying information be more expedient and efficient. To enhance dissemination of information to the public, the Report recommended that the Joint Information Center (JIC) be the only point of contact for media releases and that all information should be passed on to the JIC to streamline information sharing. The Report also found that information sharing would be enhanced if more personnel received training on operating the communications equipment. Although preexisting communications equipment seemed sufficient, personnel were not familiar with the emergency communications systems.[227]

The Report offered several recommendations relating to public health issues that surfaced during the exercise. The first was that a Psychological First Aid and Crisis Counseling Center should be established immediately after a disaster occurs as a way to get bystanders or victims who do not need urgent medical attention away from the incident site. In the event that individuals need to undergo decontamination, the Report suggested that the Department of Public Health, as well as other public health agencies and organizations, be available throughout the decontamination process. One phenomenon that is prevalent at incidents is the 'worried well.' These are people who do not actually need urgent medical care but believe they might need to be treated. They divert attention away from those who do need urgent medical care. To remedy this problem, the Report recommended that procedures for screening and treating these 'worried well' be developed so that health care personnel can focus on patients with serious medical concerns. Since the scenario was a simulated chemical attack, one lesson learned was that hospitals need to be more prepared to deal with the public health consequences of such an attack. For example,

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[227] *Ibid*.

health care personnel should receive training on how to operate decontamination equipment. Additionally, a tracking system and set of protocols should be developed to monitor patients, and standard operating procedures should be implemented to determine if and how potentially affected staff should be allowed back into health care facilities.[228]

The last area addressed in the Report's findings was that of business continuity and the involvement of the private sector. The Report recommended that procedures for private sector representation in the EOC should be formalized and that private sector officials should be involved with emergency preparedness training and domestic response initiatives. These efforts could be supported by having the private sector and non-governmental organizations collaborate with communities to determine where shelters should be located, how they should be run, and what community resources would be necessary in an incident. Lastly, since the private sector accounts for 85% of critical infrastructure in the U.S., the Report recommended more substantial efforts should be made to evaluate critical infrastructure, conduct exercises, ensure backup systems, and identify single points of failure that could be addressed in redundancy efforts.[229]

Areas of Improvement

The State of Connecticut has made advances in its emergency management practices and has implemented initiatives to give more resources to first responders. The following section highlights these improvements for first responders, mutual aid

[228] *Ibid*., p. 7.
[229] *Ibid*.

and regional cooperation, public outreach efforts, training and exercises, and the private sector and critical infrastructure protection.

First responders

In 2005, Governor Rell signed a directive that made the National Incident Management System (NIMS) the standard system used by first responders in responding to domestic incidents and emergency situations. That enabled municipalities to qualify for federal grants. In order to facilitate incorporating this system into the practices of response agencies, the Connecticut Department of Emergency Management and Homeland Security (CT DEMHS) established five regions and an implementation plan to effectively coordinate and execute planning, training, and response efforts.

A one-channel analog simulcast system, called the Connecticut Statewide Police Emergency Radio Network was launched in 2008, which provided interoperability for law enforcement agencies across the state. This network can be used with stationary and mobile communications units and provides 97% coverage of mobile communications systems throughout Connecticut.[230]

In order to improve communications capabilities, the CT DEMHS has provided guidance on how to operate a very high frequency (VHF) radio system, which is used to facilitate communications between all the municipalities in Connecticut. This system has five different radio frequencies, each of which is designated to a CT DEMHS region.

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[230] Emergency Management and Homeland Security Coordinating Council, Report to Governor M. Jodi Rell and the Connecticut General Assembly, January 1, 2009, p. 10.

The ICALL/ITAC system* has also been implemented and expanded with the deployment of more than 1,100 portable 800 MHz radios to emergency response command staff such as fire and police chiefs and local emergency managers. These radios provide crucial interoperability for essential command staff during incidents in Connecticut. This program has also been supported by the statewide distribution of Statewide Tactical On-Site Communications boxes.[231] Another system that has been utilized in Connecticut is the State Tactical on Scene Channel, which provides radio communications interoperability at an incident through already existing radio technology.[232]

Even though non-traditional first responders do not have to be NIMS or ICS compliant, the CT DEMHS provided trainings and seminars in NIMS and ICS from 2007 to 2008. Training and distance learning components have also been utilized by the CT DEMHS to increase the number of traditional first responders such as police, fire, and EMS with NIMS training. This enables the individuals invited to receive such training without increasing the financial burdens already borne by local first responder agencies.[233]

To further support interoperability in communications, the State Communications Interoperability Plan (SCIP) was established in 2007, which includes strategies for improving communications interoperability in the short and long term. Additionally, the Tactical Interoperability Communications Plan was

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[231] Department of Emergency Management and Homeland Security At a Glance, (Hartford, CT: 2007/2008). *Designated herein as DEMHS (year).
[232] John Gustafson, Interoperable Communications Moving Forward, (June 30, 2009), p. 5.
[233] DEMHS (2007/2008).
* The ICALL/ITAC system is an 800 MHz statewide conventional radio system to facilitate multi-agency and multi-jurisdictional interoperability with command and control communications during incident response efforts.

developed for each of the five regions. This plan lays out the procedures for how communications will be carried on in an incident now rather than in the long term.[234] These plans are supported by the Interoperable Emergency Communications Grant Program, which also provides funding for developing procedures for these systems as well as performing training in their operations.[235] The Communications Unit Leaders are another component of the SCIP. They are trained personnel who assist the incident commander in setting up communications systems that support command and control and interoperability functions during response efforts.[236]

The Housatonic Valley Planning Region provides a specific example of where improvements have been made. Along with training and drills to improve emergency preparedness and response, the region has taken additional steps to enhance its ability to respond in an incident. For example, activities to support a hazardous materials (hazmat) response team for the area have been implemented, and new videoconferencing equipment was installed in 2004. This aides command staff during incidents and provides images of incidents and maps to enhance coordination between different jurisdictions or agencies.[237]

In terms of providing urgent medical care to victims of emergencies, the State of Connecticut has purchased a mobile hospital with a 100-patient capacity. This facility could be deployed to any part of Connecticut and could be assembled without much notice. Personnel from the Connecticut Medical Assistance Team, the group that would staff the mobile hospital in an incident, have received training so that they

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[234] Gustafson, p. 2.
[235] *Ibid*., p. 3.
[236] *Ibid*.
[237] Housatonic Valley Council of Elected Officials, "Emergency Preparedness and Response Update on Regional Emergency Planning," (June 2009).

are familiar with the facility and can use it effectively. This team has also been specifically trained to know how to respond to and use equipment for a contamination incident.[238]

Mutual aid and regional cooperation

From 2008-2009, the CT DEMHS helped create Regional Emergency Planning Teams (REPTs). These teams enhance regional cooperation efforts in each of the five regions and are comprised of personnel from multiple jurisdictions and agencies. They have been a key component in leading needs-assessments in their regions and developing a regional emergency operations plan.[239] Furthermore, the CT DEMHS is collaborating with these teams, as well as with regional planning organizations, to establish procedures between the five regions to support regional resource sharing, communications, and emergency service coordination during an incident.[240]

The Connecticut Department of Public Health has also encouraged regional cooperation in recent years. In 2006, ten municipalities signed a regional mutual aid agreement to be used during a public health emergency. This is intended to ensure that if one city or town is overwhelmed by the demand on health facilities, supplies, or personnel, procedures are in place for other localities to contribute to response efforts.[241]

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[238] University of Connecticut College of Continuing Studies, p. 9.
[239] DEMHS (2007/2008).
[240] DEMHS (2006/2007).
[241] Housatonic Valley Council of Elected Officials.

Public concerns

From 2005-2006, the CT DEMHS made extensive efforts to educate the public about emergency preparedness. These efforts included presentations by top officials in the CT DEMHS, informational brochures placed in major newspapers throughout the state, and a public education campaign focused on emergency preparedness and issues related to terrorism.[242]

In 2005, the CT DEMHS partnered with the statewide public affairs network to provide broadcasts of emergency operations centers during emergencies. This initiative provides an outlet for the public to receive accurate and up-to-date information during an incident.[243] Public education efforts were continued in 2006 and 2007 with public service announcements on radio and television stations, messages on buses and trains, and an outreach campaign to children on a popular children's television channel.[244] From 2007 to 2008 more public announcement campaigns were undertaken through various media outlets to reach diverse parts of the population, including people for whom Spanish is the primary language. In addition to the standard newspaper, radio, and television ad campaigns that had been used in the past, Internet advertisements were also utilized to raise emergency preparedness awareness.

Some residents in Connecticut are particularly at risk of potential exposure to hazmat due to their close proximity to the Millstone Nuclear Power Plant in Waterford, CT. Public education events were organized from 2006 to 2007 to notify residents of the risk and to provide information on how to prepare for a radiological

[242] DEMHS (2005/2006).
[243] *Ibid*.
[244] DEMHS (2006/2007).

threat. Meetings with representatives from the plant and from the surrounding communities were held to discuss potential issues and questions raised by local residents.

The CT DEMHS worked with the National Weather Service and the CT Department of Education in 2007 and 2008 to install public alert radios in all the public schools in Connecticut so that schools can receive accurate and up-to-date information on severe weather threats.[245] In 2008 and 2009, the CT DEMHS contributed to the development and installation of a statewide Emergency Notification System, which would disseminate information through an Internet based system to Connecticut citizens in the event of an emergency.[246] Additionally, the City of New Haven has developed a system that would send warning messages to citizens, via phone or email, about severe weather threats.[247]

Training and exercises

Since the Northeast Blackout of 2003, various drills and exercises have been executed in Connecticut to test the State's ability to respond to an emergency. Some of these activities are specific to threats that exist in Connecticut, such as radiological plume release drills in the communities neighboring the Millstone Nuclear Power Plant, which took place every year from at least 2004 to 2007. Others are more general in scope, such as tabletop exercises and continuity of operations tests for a pandemic influenza event, hurricane and winter storm drills and tabletop exercises, and a Strategic National Stockpile drill.

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[245] DEMHS (2007/2008).
[246] DEMHS (2008/2009).
[247] Fran Silverman, "After Katrina, Taking Precautions in Connecticut," *The New York Times* (August 29, 2008).

Some of the exercises focused on the ability of an area to respond effectively to an incident. Host community drills occurred in the Storrs/Mansfield and the Norwich areas between 2004 and 2007.[248] Two other examples of regional drills occurred when the Housatonic Valley Planning Region conducted a hazmat drill in 2006 and a pandemic drill in 2008 using the region's new mobile field hospital.[249] Smaller scale exercises like these happen frequently throughout the State of Connecticut to ensure that municipalities or certain regions can respond effectively to an incident.

In 2007, an exercise was conducted to test the state's newly developed continuity of operations plans. In that same year, the Urban Search and Rescue Team participated in training to enhance their ability to respond to heavy vehicle and machinery incidents and to effectively employ the Incident Command System. Furthermore, the Urban Search and Rescue Team was involved with an exercise that tested their ability to respond to a building collapse that was followed by a hazmat explosion.[250] The CT DEMHS also participated in a nationwide drill in 2006 to test preparedness for a major hurricane.[251]

Emergency operations centers and the CT DEMHS

In 2006, Homeland Security grant funds helped establish the municipal high band radio initiative, which provides communications capabilities between municipalities and CT DEMHS regional offices. HAM radios were also deployed at each of the five regional offices to facilitate information sharing during an incident.

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[248] http://www.ct.gov/dds/cwp/view.asp?a=12&q=393460
[249] Housatonic Valley Council of Elected Officials.
[250] DEMHS (2006/2007).
[251] DEMHS (2005/2006).

To assist with flood mitigation planning, evacuation planning, and debris removal, the first phase of implementing a Geographic Information System began in 2006. This type of system can produce detailed maps that can provide important information to emergency managers following an emergency and can support response efforts. This initiative is further enhanced with the new Geospatial lab that was added to the EOC and GIS experts volunteered to assist with GIS data collection and analysis during drills, exercises, and real life incidents.[252]

In 2008, the CT DEMHS established a WebEOC application, which facilitates information sharing and communications for emergency managers during response and recovery efforts through the Internet. Training was also provided to all CT DEMHS employees as well as personnel with local emergency management agencies and the private sector.[253]

Private sector and critical infrastructure protection (CIP)

A Critical Infrastructure Unit was established in 2005 to assist with efforts to protect critical infrastructure in the state. As of 2006, the Critical Infrastructure Unit has brought in $850,000 in grants to support CIP initiatives. One initiative aims to improve the ability of local law enforcement agencies by providing physical protection and security for infrastructure that has been identified as "critical" by the Department of Homeland Security. Additionally, risk assessments of critical infrastructure have been conducted by this unit, including security assessments of

[252] DEMHS (2006/2007).
[253] DEMHS (2008/2009).

certain transportation sites such as port, rail lines[254] and bus depots, which have provided guidance on what areas should be improved.[255]

In the wake of Hurricane Katrina, which struck Louisiana and Mississippi in 2005, debris was left all over the coastlines and took months to clear. To prevent this problem from becoming a reality in Connecticut in the event of a major hurricane, the State has entered into contracts with companies that provide debris removal services in the event of a hurricane or other severe weather incident.[256]

Evacuation and mass care sheltering

Planning for evacuation procedures and sheltering/mass care facilities began in late 2005 and resulted in a Regional Evacuation and Shelter Guide for emergency managers. These guides provide information on shelter locations and evacuation routes. The CT DEMHS coordinated with several other agencies and groups to ensure that there would be universal access to shelters in an emergency. Such facilities would be preplanned, adequately equipped and operated to support a large group of people, including persons with disabilities or older adults.[257] To facilitate evacuation planning, the Connecticut Department of Transportation has acquired GIS programming and is working on an inventory of important traffic information such as speed limits, road capacities, and underpass measurements.[258]

From 2006 to 2007, the CT DEMHS provided local emergency managers with information on how to establish Local Distribution Points (LDPs). These are sites

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[254] DEMHS (2006/2007).
[255] DEMHS (2005/2006).
[256] Silverman, *The New York Times*.
[257] DEMHS (2006/2007).
[258] Minutes, Local Emergency Planning Commission, Wolcott, CT, January 19, 2009, http://www.wolcottct.org/detail.cfm?&sid=19&nid=332.

where FEMA supplies such as food, water, and tents can be distributed to citizens in the event of an emergency. To facilitate this process, CT DEMHS drafted a Commodities Distribution Standard Operating Procedure for emergency managers, which gives further guidance on how FEMA supplies should be requested and procedures for how to handle and distribute the supplies once they are received.[259]

One example of an evacuation plan that has been established was developed by Fairfield County. In the event that an evacuation order is declared for a major hurricane, the Merritt Parkway and I-95 would have all lanes going north to ease traffic congestion. Procedures for bus transportation have also been included in these hurricane evacuation plans. In New Haven, for instance, school bus drivers have been contracted to assist with evacuating citizens in the event of a hurricane or major weather event.[260]

The City of New Haven has determined recently constructed schools where shelters could be established that have backup power from generators and food vending companies that would be willing to contribute food in an emergency. To ensure that persons in New Haven with disabilities or special needs are evacuated, a directory of these citizens has been created so that they may be assisted during an evacuation.[261]

Personal Accounts from First Responders

While there has been significant progress made in Connecticut, particularly for first responders, there are still areas where vulnerabilities remain. Interviews were conducted with two fire fighters and one police officer to identify some of the

[259] DEMHS (2006/2007).
[260] Silverman, *The New York Times*.
[261] *Ibid*.

challenges that first responders face across the State, as well as improvements that have been made.

The first interview was conducted with a Fire Inspector/Firefighter with the Mohegan Tribal Fire Department (MTFD) on April 11, 2010. The second interview was with a volunteer Fire Captain with the Southbury Fire Department (SFD) on April 11, 2010. The third interview was with a Sergeant with the New Haven Police Department (NHPD) on April 21, 2010. The interviews lasted from 30 minutes to an hour and were conducted both in person and on the phone.

Communications

While there have been advances in communications technology, there are considerable differences among the three first responder departments whose members were interviewed in terms of the extent to which communications systems have been updated to support interoperability. The MTFD has obtained portable radios from other departments but this system has not worked well. Rather than using the existing radio system to contact other departments, the MTFD has one radio for each department that they must use to get in touch with separate departments. For example, the MTFD has one radio to contact the Norwich Fire Department, one radio to contact the Groton Fire Department, and so on. This is an inefficient system and would cause major gaps in communication if a large-scale emergency requiring extensive interagency coordination ever occurred. There is a system in place called VOIP (voice over Internet providers) that has been demonstrated at training sessions, which will allow patching of communications between different departments.

However, in the event of a power outage or technology failure, communications would not be supported since this system operates through the Internet.

For the SFD, upgrades have been implemented but problems still remain in contacting other people. For example, more space is available to use on the radio spectrum, creating more channels, but there are still glitches with the high-band system that was recently installed. Overall, interoperability in the area has improved significantly since 9/11, and officers can talk to each other when an incident occurs and requires response of various agencies and departments.

There is a scan channel on which the NHPD can call neighboring police departments. This scan channel also allows NHPD officers to monitor the New Haven Fire Department and ambulance services in the city, but does not allow them to monitor neighboring communities' EMS or fire services. The NHPD has also begun installing the equipment that supports the Connecticut Statewide Police Emergency Radio Network in patrol cars, but it is not a department-wide resource yet. This system has given the NHPD better communications ability with jurisdictions that are not supported by the scan channel (in other words, with jurisdictions that do not neighbor New Haven), although it could be streamlined even more. As it operates now, the Connecticut State Police runs the system, and local departments must go through the State Police in order to contact other departments.

Interagency coordination and mutual aid agreements

According to the Fire Inspector from the MTFD, tensions still exist, and several agencies are territorial when responding to an incident. However, interagency training and information sharing has improved in the area. Other departments have

toured the MTFD facility and attended trainings to become familiar with the resources the MTFD has and can contribute when mutual aid is necessary; these activities have been helpful to determine where gaps in resources and training, particularly with specialty training, exist. While certain departments and personnel have become familiar with MTFD resources, this knowledge has yet to be fully translated into mutual aid agreements or passed on to other departments that have not participated in tours or training sessions. Cross training has occurred with other departments, although, in various emergency management practices; for instance, the MTFD received training about its command structure from the Norwich Fire Department. Furthermore, the local Incident Management Team, comprised of chiefs from various departments, has received specialized training to support the incident commander during an emergency. Training is also conducted with the MTFD and local EMS for special response situations, such as confined spaces. Hazmat and radiation exercises are conducted with first responders from the sub base in Groton, as well.

While some tension exists between the SFD or other local fire departments and local police departments, interagency coordination is relatively effective. Training is conducted as frequently as possible, and there are efforts to learn about the different resources of other departments. In the event that mutual aid is required, an officer from the SFD will contact a dispatcher to tell him or her what resources are needed and the dispatcher will locate those resources and dispatch other departments to the scene. However, while training between different departments and agencies has been implemented, regional drills and exercises have been not conducted.

The NHPD participates in mutual aid regularly with day-to-day events and also coordinates with the State Police when additional assistance is needed. Although interagency training occurs with specialized units such as the Bomb Squad and SWAT teams, there is no department-wide training with other departments or agencies.

Standard Operating Procedures

The Fire Inspector explained some of the challenges that the MTFD and local fire departments still experience during an incident in regard to SOPs. One such vulnerability is that SOPs for unassigned personnel have yet to be fully established. This leads to a lack of accountability when unassigned personnel arrive at scenes in their personal vehicles and fail to report to a staging area to receive important information. Additionally, different credentialing protocols cause confusion when multiple jurisdictions respond to an incident. There are emergency operations plans in place, however, that define roles and responsibilities for casino personnel (in addition to members of the MTFD) and an evacuation plan has been developed for each department in the Mohegan Casino to assist the MTFD in evacuating guests. The MTFD has implemented ICS, but issues still remain with plain language and standardized terminology. Vehicle identification has yet to fully incorporate standardized terminology, and local police departments still operate using their own specific codes.

The SFD has implemented NIMS, and although it works relatively well, there is still some confusion. This is likely to resolve itself with more time and practice. The SFD has made a shift to using plain language. However, these efforts have been

complicated by the fact that local police departments still use departmental codes that are not standard for NIMS or ICS. Staging protocols for personnel have also been established and have been effective in tracking personnel in incident response efforts.

The NHPD officer has no recollection of receiving NIMS or ICS training, so the extent to which they have been implemented is unclear. The NHPD uses its own codes that differ from other police departments or first responder agencies, and its command structure does not conform to any standardized procedures. Most protocols for responding to an incident are developed on the fly and are not formalized.

Equipment and resources

The MTFD has two sets of personal protective equipment that have been provided through the tribe and federal and state grants and are not standard issue. The MTFD has also been equipped with hazmat decontamination trailers and meters, as well as Geiger counters (a portable device used to detect ionizing radiation or nuclear radiation) and a small chemical lab. To track resources and personnel, fire chiefs and incident commanders with the MTFD still rely largely on low-technology systems, such as pen and paper or white boards. Some are beginning to use software and laptops, but these systems are more expensive.

The SFD has CBRNE (chemical, biological, radiological, nuclear, and explosives) equipment in addition to hazmat and blood borne pathogens suits. They also have meters to detect these agents and decontamination showers that can be set up in the event of exposure. Members of the SFD have participated in training to prepare for hazmat or other terrorist incidents, although the trainings have decreased in frequency in the years after 9/11. Officers with the SFD have more advanced

technology to track personnel, which involve 'touch-and-track' scans that scan personnel into a software system so that personnel can be monitored and moved around electronically. The SFD also uses a system that provides critical information for personnel, including contact information and medical records.

The NHPD provides personal protection equipment such as hazmat suits for the specialized units; however, this equipment is not standard issue. Some officers have been provided portable radiation detectors that are helpful in train stations or with suspicious packages or luggage, but these are not provided department-wide.

Recommendations

Based on the information gathered from the different reports, newspaper articles and agency websites, in addition to the insight offered by the three first responders, the following recommendations would contribute to effective emergency preparedness initiatives and response efforts.

Communications

Interoperability of communications remains a challenge throughout the State of Connecticut. A system like the Connecticut Statewide Police Emergency Radio Network should be developed and implemented across the State so that police, fire, and EMS can communicate with each other. If this network is used, however, it should eliminate the State Police as the go-between and should rather just connect first responders directly. To ensure that communications capabilities are maintained in the event of a large-scale power outage, plans to be followed in the event of a communications failure should be developed and implemented, along with training

and exercises so that personnel are familiar with the procedures, and weaknesses are identified prior to such an event occurring.

Interagency coordination and mutual aid agreements

More extensive interagency coordination should be implemented, particularly with training sessions and regional exercises so that departments and agencies are more familiar with each other and with resources at other departments. It would be beneficial for the SFD and NHDP to engage in regional training and exercises with agencies and departments in New York City so that in the event of a catastrophic event in the NYC metropolitan area interagency coordination would be successful and effective. Training and exercises could either be functional in nature (i.e. focusing on how ICS will be employed or mutual aid agreements will be carried out) or situational (i.e. what would happen in the event of a nuclear attack on the MetroNorth rail line or an outbreak of anthrax). These advances should be reflected in mutual aid agreements so that there is a clearer sense of what resources would be available from each department during a certain type of incident.

Standard operating procedures

More detailed SOPs for off-duty and unassigned personnel need to be developed and practiced so that accountability is not compromised in a response effort. Credentialing procedures should be standardized across the State so that personnel receive identical identification tags depending on their role or certification so they can be quickly and easily identified. Police departments across the State need to become compliant with standards of NIMS and ICS so that response efforts

involving law enforcement, fire, and EMS services can be more effectively coordinated.

Equipment and resources

All first responders should be provided personal protective equipment so that their ability to respond in a chemical, biological, radiological, or nuclear event are not compromised because they do not have sufficient equipment to protect themselves. More advanced systems to track personnel and resources should be installed across the State so that there is a more accurate record of their deployment that can be backed up in the event that the central system is destroyed.

Summary

Progress has been made in the State of Connecticut to enhance its ability to respond to an incident, largely due to lessons learned from previous emergencies, including 9/11 and the Northeast Blackout of 2003. They have been further tested by the federal TOPOFF 3 exercise. However, further improvements are needed so that in the event of a large-scale emergency that involves multiple jurisdictions and agencies, first responders can effectively respond to the incident.

CONCLUSION

This work was undertaken to test the thesis that although following the 9/11 attacks many proposals were made to improve the country's ability to respond to large-scale domestic emergencies, the lessons of 9/11 did not result in substantially improved response capabilities. Therefore, the U.S. is more vulnerable to terrorist attacks and other large-scale emergencies. Few of the lessons from large-scale emergencies such as the 9/11 attacks and the Northeast Blackout of 2003 have been incorporated into emergency management plans and practices at the local, state, and federal levels. There is a significant imbalance between the heavy focus on initiatives abroad and those that would improve domestic response capabilities. This reflects a glaring weakness in U.S. national security policy.

To test this thesis, this work addressed five main research questions. First, what lessons about domestic disaster preparedness and response were learned from the response to 9/11? Second, to what extent were the lessons learned from 9/11 implemented, and how were those lessons reflected in the response to other large-scale emergencies such as the Northeast Blackout of 2003? Third, what lessons were learned from the Northeast Blackout, and to what degree have they been reflected in changes to emergency preparedness and response initiatives in Connecticut? Fourth, what are the national security implications that can be drawn from the responses to these large-scale emergences? Lastly, in what ways can the U.S. domestic disaster response be improved to meet the country's national security needs?

The first part of this chapter summarizes key findings and trends. The second part analyzes the implications for national security. The third part outlines how this work contributes to the literature. The chapter concludes by identifying areas for future study.

Findings

The analysis from the first three chapters revealed that problems still remain in the ability of the U.S. to respond to large-scale emergencies. While some improvements have been made for first responders, including advances in communications systems, they still remain unprepared to respond to a large-scale domestic emergency. First responders are an integral component of response efforts, yet they still lack adequate training, equipment, sophisticated tracking systems, or sufficient interagency communication abilities.

Cooperation between neighboring jurisdictions has improved and there have been some efforts to coordinate across state borders. For example, transportation agencies in New York and Connecticut work together regularly and have created a committee to facilitate information sharing. Despite these efforts, however, regional cooperation is still lacking. If a large-scale incident ever occurred again in New York City, first responders from Connecticut, particularly from New Haven County, would not be familiar with New York City's emergency management practices. If more regional exercises and trainings were undertaken, first responders in Connecticut would be better prepared to assist New York City. As some of the National Planning Scenarios show, a terrorist attack could potentially affect many people or have a wide impact-area, necessitating the activation of mutual aid agreements with neighboring

cities or states. Due to this potentiality, mutual aid agreements need to be reinforced and more interagency training and exercises should be carried out.

Standard operating procedures are not as extensively adopted as they should be. For example, police officers in New Haven are not familiar with the National Incident Management System or the Incident Command System structure. That raises two questions for which, so far, there is insufficient data. How many other first responders have yet to be trained in these critical programs? Do they have the resources to respond effectively to a large-scale emergency? Throughout the nation, compliance with NIMS and ICS should be statewide and strengthened with training and exercises. While mutual aid agreements exist, they often do not include an inventory of the resources that other jurisdictions would be able to contribute. Additionally, credentialing needs to be more standardized so that first responders from different agencies or jurisdictions can be allowed on-scene to support response efforts.

The State of Connecticut has not yet been the target of a terrorist attack, so it is impossible to have an accurate sense of how prepared it is to manage a large-scale emergency. While exercises like TOPOFF 3 provide insight into Connecticut's level of preparedness, nothing short of an actual terrorist attack or other serious incident will reveal all the weaknesses that exist in emergency management practices. However, the State of Connecticut should continue to refine its program of simulated large-scale emergencies like TOPOFF 3 to improve its capacity to respond and recover.

Implications for National Security

To be secure, a nation must seek to reduce the potential for attack from abroad, but because complete security against such attacks is never possible, it must also develop rapid, effective response capabilities for large-scale emergencies at home. Following the 9/11 attacks the U.S. has emphasized the former, viewing national security as an issue of "war" against foreign terrorists that involves major military and foreign policy initiatives. That strategy has dominated policy for domestic homeland security as well by focusing heavily on intelligence and investigation. Yet actual security in each area is weakened if both are not strengthened. Rather than considering them as two entirely different policy areas, the ways in which they support each other and interconnect should be emphasized. One cannot have an effective military and foreign security policy without an effective domestic security policy, and vice versa. No matter how much the U.S. focuses on issues abroad, if the U.S. cannot provide adequate resources and training domestically, it will not be able to respond to and recover from a large-scale emergency. Since security analysts maintain that it is inevitable that the U.S. will be the target of another terrorist attack, more focus should be given to ensuring that our domestic emergency response capacity is robust and aggressive.

Contribution to the Literature

This work contributes two important things to the literature. The first is a detailed analysis of two large-scale domestic emergencies, the 9/11 attacks and the Northeast Blackout of 2003. These two events have not previously been studied together in such depth, nor have the relevant reports and articles published about them

been compiled into one work. There are many similarities between these two events that illustrate how domestic emergency preparedness is still viewed as different, and to a certain degree less important, than the "war on terrorism" as defined by the Bush administration. This work's analysis demonstrates the implications for national security that were inherent in the flawed responses to these incidents.

The second significant contribution is an analysis of the degree to which lessons from 9/11 and the Blackout have been implemented using one state, Connecticut, as a case study. While the University of Connecticut prepared an After-Action Report following the TOPOFF 3 exercise, this exercise and subsequent report only focused on one area of Connecticut and its ability to respond to a certain type of disaster. This study went beyond that report by demonstrating areas of improvement or weakness in the years following the TOPOFF 3 exercise.

Furthermore, interviews that were conducted provided original research and contributed to the overall understanding of the extent to which lessons have been implemented for first responders in Connecticut. While research had suggested that first responders in Connecticut were sufficiently prepared and significant efforts had been made to enhance emergency preparedness and response activities, the first responders provided the context for those achievements and revealed areas in which they experienced inadequate preparation and inconsistencies in state-wide emergency response initiatives.

Areas for Further Study

This work used the State of Connecticut as a case study to determine the extent to which lessons have been implemented to enhance emergency management

practices. Connecticut is not representative of all other areas of the U.S., so further research should include other states. Particular attention should be paid to states and regions where the threat of terrorist attack or natural disaster is especially high.

Similarly, a broader range of interviews with first responders would provide a clearer picture of how prepared Connecticut is to respond effectively to a disaster. Other people involved in emergency response, such as hospital administrators, emergency medical services personnel, transportation and public utilities personnel, and emergency planners and managers could be interviewed to get a sense of how prepared other agencies are for a large-scale emergency.

While transportation plans and evacuation procedures were examined, in part through online research, they were not supplemented by interviews with transportation personnel or emergency managers to identify weaknesses in these plans. Research could be done to determine if state-wide initiatives have been carried out successfully or if more work remains to be done to enhance the ability for the State of Connecticut to evacuate or move large populations in an emergency situation.

More research could be done to assess hospital emergency preparedness and the ability of the U.S. public health infrastructure to respond to a large-scale emergency. While recommendations for hospitals and the healthcare system were put forth in the aftermath of the Northeast Blackout, a review of the status of those recommendations would be helpful in identifying areas for further improvement.

Furthermore, representatives from the private sector could be interviewed to assess how prepared they are for an emergency and how effective are their continuity of operations plans. In general, more research could be done to identify areas where

the private sector has been proactive in its emergency management practices or areas where more improvement is needed.

Further research could include analyzing different types of large-scale emergencies, such as natural disasters and public health emergencies, including the anthrax scare and the H1N1 outbreak. These would provide additional lessons for improving emergency management practices. Analysis of international terrorist attacks, such as the Madrid bombings and attacks on the London public transportation system, might also offer more insight into how agencies in the U.S. can better prepare for a terrorist incident. Additionally, while the U.S. has not been the target of a large-scale cyber attack, this is an area where the U.S. is particularly vulnerable. Therefore, more research could be done to understand the response to small-scale cyber incidents, what the international community has done to prepare for and respond to a debilitating cyber attack, and ways in which our ability to respond to a cyber attack could be enhanced.

Further study could include a more extensive analysis of the degree to which the federal government has acted on recommendations put forth after the 9/11 attacks. Additionally, while the Department of Homeland Security was created at the recommendation of the 9/11 Commission, there has been some debate about whether this agency is effective. Some argue that the lack of information sharing and interagency coordination is being perpetuated because the DHS does not include agencies such as the Federal Bureau of Investigation or the Central Intelligence Agency, which are an integral part of homeland security issues.

Additionally, more research could be done to determine how quickly federal grants are disbursed and if those grants have had a positive impact on emergency preparedness initiatives. Since Congress is so influential in distributing federal money to states, their role in emergency preparedness could be more closely scrutinized as well.

This research has answered the initial research questions. It has proven the initial thesis to be correct in that there are many ways in which the U.S. remains deficient in being able to respond to large-scale domestic emergencies. However, there has been some improvement as seen in the response to the Northeast Blackout of 2003. Though not within the scope this work, the emergency produced by Hurricane Katrina in 2005 and the offshore oil rig explosion of 2010 reflect the continuing weaknesses. The results of this research are indicative but naturally cannot be exhaustive. They do, however, point to a rich variety of areas for further research in the field.

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