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Monterey, California: Naval Postgraduate School

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**NAVAL  
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**MONTEREY, CALIFORNIA**

**THESIS**

**ASSESSING RESILIENCE: HOW PLANS, STRATEGIES,  
AND AFTER ACTION REPORTS CAN IMPROVE OUR  
UNDERSTANDING OF ORGANIZATIONAL  
PREPAREDNESS**

by

Melissa Nussbaum

September 2016

Thesis Co-Advisors:

Lauren Fernandez  
Glen Woodbury

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**ASSESSING RESILIENCE: HOW PLANS, STRATEGIES, AND AFTER  
ACTION REPORTS CAN IMPROVE OUR UNDERSTANDING OF  
ORGANIZATIONAL PREPAREDNESS**

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Submitted in partial fulfillment of the  
requirements for the degree of

**MASTER OF ARTS IN SECURITY STUDIES  
(HOMELAND SECURITY AND DEFENSE)**

from the

**NAVAL POSTGRADUATE SCHOOL  
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## **ABSTRACT**

Resilience has emerged as a prominent term throughout homeland security and emergency preparedness doctrine. The National Preparedness Goal, the United States Department of Homeland Security's (DHS) guiding strategic document, defines success as "having a secure and resilient Nation." The homeland security enterprise is promoting resilience, yet there is little literature on resilience at the organizational level in public safety agencies—organizations that are key to the homeland security enterprise. This thesis sought to answer two questions: First, how can existing public safety doctrine contribute to an understanding of the organizational resilience of public safety agencies? Second, how can after action reports (AARs) and their resultant learning process contribute to an understanding of adaptive capacity? To answer the research questions, this thesis applied New Zealand's resilience management framework to public safety agency doctrine. The research found that public safety agencies are engaged in activities that contribute to understanding their organizational resilience. It also found that the New Zealand framework can provide a working construct for understanding resilience within U.S. public safety agencies. Recommendations include standardizing AARs with federal guidance and making them publicly available to further contribute to understanding organizational resilience.



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# TABLE OF CONTENTS

<b>I.</b>	<b>INTRODUCTION.....</b>	<b>1</b>
<b>A.</b>	<b>PROBLEM STATEMENT .....</b>	<b>1</b>
<b>B.</b>	<b>THESIS OUTLINE.....</b>	<b>2</b>
<b>C.</b>	<b>LITERATURE REVIEW .....</b>	<b>3</b>
<b>1.</b>	<b>Defining Resilience.....</b>	<b>4</b>
<b>2.</b>	<b>Resilience in the Homeland Security Enterprise.....</b>	<b>6</b>
<b>3.</b>	<b>Resilience in Public Safety Doctrine.....</b>	<b>9</b>
<b>4.</b>	<b>Organizational Resilience—Frameworks and Tools within the Homeland Security Enterprise .....</b>	<b>13</b>
<b>5.</b>	<b>Organizational Resilience—Frameworks and Tools outside of the Homeland Security Enterprise .....</b>	<b>19</b>
<b>D.</b>	<b>CONCLUSION .....</b>	<b>24</b>
<b>II.</b>	<b>RESEARCH DESIGN.....</b>	<b>25</b>
<b>A.</b>	<b>RESILIENCE MANAGEMENT FRAMEWORK.....</b>	<b>25</b>
<b>B.</b>	<b>RESILIENCE INDICATORS .....</b>	<b>26</b>
<b>C.</b>	<b>SAMPLE OF PUBLIC SAFETY DOCTRINE.....</b>	<b>29</b>
<b>D.</b>	<b>ANALYSIS TOOL.....</b>	<b>31</b>
<b>E.</b>	<b>LIMITATIONS AND IMPLICATIONS .....</b>	<b>33</b>
<b>III.</b>	<b>ANALYSIS PART ONE—SITUATIONAL AWARENESS AND MANAGEMENT OF KEYSTONE VULNERABILITIES RESILIENCE ATTRIBUTES.....</b>	<b>35</b>
<b>A.</b>	<b>TEXAS .....</b>	<b>36</b>
<b>1.</b>	<b>Situational Awareness .....</b>	<b>36</b>
<b>2.</b>	<b>Management of Keystone Vulnerabilities.....</b>	<b>37</b>
<b>B.</b>	<b>VIRGINIA .....</b>	<b>39</b>
<b>1.</b>	<b>Situational Awareness .....</b>	<b>39</b>
<b>2.</b>	<b>Management of Keystone Vulnerabilities.....</b>	<b>40</b>
<b>C.</b>	<b>NEBRASKA .....</b>	<b>41</b>
<b>1.</b>	<b>Situational Awareness .....</b>	<b>42</b>
<b>2.</b>	<b>Management of Keystone Vulnerabilities.....</b>	<b>43</b>
<b>D.</b>	<b>SYNTHESIS .....</b>	<b>44</b>
<b>IV.</b>	<b>ANALYSIS PART TWO—ADAPTIVE CAPACITY RESILIENCE ATTRIBUTES.....</b>	<b>49</b>
<b>A.</b>	<b>AMERICAN CIVIC ASSOCIATION SHOOTING AFTER- ACTION REPORT &amp; IMPROVEMENT PLAN .....</b>	<b>50</b>

B.	<b>2013 BOSTON MARATHON BOMBING AFTER ACTION REPORT .....</b>	<b>55</b>
C.	<b>MAY 2014 SAN DIEGO WILDFIRES AFTER ACTION REPORT .....</b>	<b>59</b>
D.	<b>SYNTEHSIS .....</b>	<b>62</b>
V.	<b>FINDINGS AND AREAS FOR FURTHER STUDY .....</b>	<b>65</b>
A.	<b>FINDINGS .....</b>	<b>65</b>
B.	<b>AREAS FOR FURTHER STUDY .....</b>	<b>68</b>
C.	<b>CONCLUSION .....</b>	<b>69</b>
	<b>APPENDIX A. ANALYSIS FOR SITUATIONAL AWARENESS AND MANAGEMENT OF KEYSTONE VULNERABILITIES ATTRIBUTES OF RESILIENCE .....</b>	<b>71</b>
	<b>APPENDIX B. ANALYSIS FOR ADAPTIVE CAPACITY ATTRIBUTES OF RESILIENCE .....</b>	<b>75</b>
	<b>LIST OF REFERENCES .....</b>	<b>77</b>
	<b>INITIAL DISTRIBUTION LIST .....</b>	<b>83</b>

## LIST OF FIGURES

Figure 1.	Argonne National Laboratory's Framework.....	16
Figure 2.	Planning Index from Argonne National Laboratory.....	18
Figure 3.	Resilience Indicators.....	26
Figure 4.	Analysis Tool 1—Situational Awareness (SA) and Keystone Vulnerabilities (KV).....	31
Figure 5.	Analysis Tool 2—Adaptive Capacity (AC).....	31

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## LIST OF TABLES

Table 1.	Completed Analysis Tool 1—Texas .....	38
Table 2.	Completed Analysis Tool 1—Virginia .....	41
Table 3.	Completed Analysis Tool 1—Nebraska .....	44
Table 4.	Comparative Content Analysis—Analysis Tool 1 .....	45
Table 5.	Stakeholders in After-Action Report & Improvement Plan .....	52
Table 6.	Completed Analysis Tool 2—Broome County.....	54
Table 7.	Completed Analysis Tool 2—Boston .....	59
Table 8.	Completed Analysis Tool 2—San Diego County.....	61
Table 9.	Comparative Content Analysis—Analysis Tool 2.....	62
Table 10.	Detailed Completed Analysis Tool 1—Texas .....	71
Table 11.	Detailed Completed Analysis Tool 1—Virginia.....	72
Table 12.	Detailed Completed Analysis Tool 1—Nebraska.....	73
Table 13.	Detailed Completed Analysis Tool 2—Broome County .....	75
Table 14.	Detailed Completed Analysis Tool 2—Boston.....	75
Table 15.	Detailed Completed Analysis Tool 2—San Diego County .....	76

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## **LIST OF ACRONYMS AND ABBREVIATIONS**

AAR	After Action Report
AC	Adaptive Capacity
ACA	American Civic Association
CDEM	Civil Defence Emergency Management
COG	Continuity of Government
COOP	Continuity of Operations
DHS	Department of Homeland Security
DPS	Texas Department of Public Safety
EMS	Emergency Medical Services
ESL	English as a Second Language
FBI	Federal Bureau of Investigation
FEMA	Federal Emergency Management Agency
KV	Keystone Vulnerabilities
MIT	Massachusetts Institute for Technology
NPG	National Preparedness Goal
OA EOC	Operational Area Emergency Operations Center
OES	Office of Emergency Services
PPD-8	Presidential Policy Directive 8
ResOrgs	Resilient Organisations
SA	Situational Awareness
THIRA	Threat and Hazard Identification and Risk Assessment



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## EXECUTIVE SUMMARY

Resilience has emerged as a prominent term throughout homeland security and emergency preparedness doctrine. The National Preparedness Goal, the United States Department of Homeland Security's (DHS) guiding strategic document, defines success as "having a secure and resilient Nation."<sup>1</sup> State public safety agencies have also incorporated resilience into their lexicon. For example, the mission statement for the California Governor's Office for Emergency Services is to "protect lives and property, build capabilities, and support our communities for a resilient California."<sup>2</sup> The vision statement in New York State's Homeland Security Strategy is "a strong, secure and resilient New York State."<sup>3</sup>

The homeland security enterprise is clearly promoting resilience, yet there is little literature on resilience at the organizational level in public safety agencies. These are the agencies expected to carry out essential missions in the homeland security realm, such as protecting life and property. The public rightfully expects these agencies to fulfill these missions during incidents and other emergencies. However, there is no systemic way to holistically understand organizational resilience in public safety agencies. A methodical approach can provide an understanding of these agencies' baseline resiliency levels.

In order to understand how public safety agencies are currently promoting resilience within their organizations, existing resources, doctrinal documents, plans, strategies, and related artifacts were reviewed. A resilience management framework from New Zealand was used to examine attributes of organizational resilience that public safety agencies are already addressing, and determine what gaps remain.

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<sup>1</sup> Department of Homeland Security, *National Preparedness Goal*, first edition (Washington, DC: Department of Homeland Security, 2011), 1.

<sup>2</sup> "About Cal OES," California Office of Emergency Services, accessed August 31, 2015, <http://www.caloes.ca.gov/cal-oes-divisions/about-cal-oes>.

<sup>3</sup> "New York State Homeland Security Strategy: 2014–2016," New York State Division of Homeland Security and Emergency Services, 4, accessed September 9, 2016, <http://www.dhSES.ny.gov/media/documents/NYS-Homeland-Security-Strategy.pdf>.

This thesis contributes to the body of literature by

- focusing on public safety agencies and organizations that are key to the homeland security enterprise;
- focusing on the organizational level of analysis for resilience (rather than community resilience or infrastructure systems); and
- analyzing existing documentation and processes to improve understanding of resilience, including (but not limited to) assessing:
  - what public safety agencies are already doing that contributes to resilience;
  - gaps between current doctrine and conceptions of what a resilient organization looks like; and
  - the way such organizations learn and process information to improve resilience.

Specifically, the thesis sought to answer the following research questions:

- How can existing public safety doctrine contribute to an understanding of the organizational resilience of public safety agencies?
- How can after action reports (AARs) and their resultant learning process contribute to an understanding of adaptive capacity?

This thesis found a variety of activities in which public safety agencies are currently engaged that contribute to understanding their organizational resilience. It also found that New Zealand's resilience management framework can provide a working construct for understanding resilience within U.S. public safety agencies. Recommendations include standardizing after action reports with federal guidance and making them publicly available to further contribute to understanding organizational resilience.

## ACKNOWLEDGMENTS

This has been such an amazing journey. It has been a privilege to be a part of this program—a wonderful, albeit trying, learning experience. I am incredibly lucky for the tremendous support network I have, personally and professionally, that saw me through this process.

This program is challenging and requires commitment not only for the students, but for our families. To my husband, Brian, and my daughter, Olivia: Thank you. You guys are the best! I could not do it without you, nor would I want to. I love you both very much. Brian, thank you for countless edits and advice on papers, projects, and this thesis. You have been tough, but I appreciate how you push to me to be my best. Our extended families and friends have jumped in and helped out in my absence during the last eighteen months, and their support, assistance, and overall understanding of my unavailability (both physically and mentally) is appreciated. I will make it up to you.

I feel very blessed to have a variety of talented professionals to encourage me and who have helped shape my career. Jim Sherry showed me incredible leadership, mentorship, and guidance, for which I will be forever grateful. Terry Hastings allowed me opportunities to broaden my perspective on homeland security and emergency management issues and encouraged my application to this program. I appreciate the insight into this program and support that I have received from colleagues and CHDS alumni John McNamara and Andrew Natoli. Dawn McGinnis, my “work mom,” has persistently asked about my progress and made sure I completed this thesis on time. Thank you.

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## I. INTRODUCTION

Resilience has emerged as a prominent term throughout homeland security and emergency preparedness doctrine. The National Preparedness Goal, the United States Department of Homeland Security's (DHS) guiding strategic document, defines success as "having a secure and resilient Nation."<sup>1</sup> State public safety agencies have also incorporated resilience into their lexicon. For example, the mission statement for the California Governor's Office for Emergency Services is to "protect lives and property, build capabilities, and support our communities for a resilient California."<sup>2</sup> The vision statement in New York State's Homeland Security Strategy is "a strong, secure and resilient New York State."<sup>3</sup>

### A. PROBLEM STATEMENT

The homeland security enterprise is clearly promoting resilience, yet there is little literature on resilience at the organizational level in public safety agencies. These are the agencies expected to carry out essential missions in the homeland security realm, such as protecting life and property. The public rightfully expects that these agencies can fulfill these missions during incidents and other emergencies, but there is no systemic way to holistically understand organizational resilience in public safety agencies. A methodical approach can provide an understanding of these agencies' baseline resiliency levels.

In order to understand how public safety agencies are currently contributing to resilience within their organizations, this thesis reviewed existing resources, doctrinal documents, plans, strategies, and related artifacts. A resilience management framework from New Zealand was used to examine attributes of organizational resilience that public safety agencies are already addressing, and what gaps remain.

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<sup>1</sup> Department of Homeland Security, *National Preparedness Goal*, first edition (Washington, DC: Department of Homeland Security, 2011), 1.

<sup>2</sup> "About Cal OES," California Office of Emergency Services, accessed August 31, 2015, <http://www.caloes.ca.gov/cal-oes-divisions/about-cal-oes>.

<sup>3</sup> "New York State Homeland Security Strategy: 2014–2016," New York State Division of Homeland Security and Emergency Services (DHSES), 4, accessed September 9, 2016, <http://www.dhSES.ny.gov/media/documents/NYS-Homeland-Security-Strategy.pdf>.

This thesis contributes to the body of literature by:

- focusing on public safety agencies and organizations that are key to the homeland security enterprise;
- focusing on the organizational level of analysis for resilience (rather than community resilience or infrastructure systems); and
- analyzing existing documentation and processes to improve understanding of resilience, including (but not limited to) assessing:
  - what public safety agencies are already doing that contributes to resilience;
  - gaps between current doctrine and conceptions of what a resilient organization looks like; and
  - the way such organizations learn and process information to improve resilience.

## **B. THESIS OUTLINE**

This chapter reviews literature on general resilience, resilience within the homeland security enterprise, and resilience in public safety doctrine. Further, it reviews organizational resilience frameworks and tools both inside and outside the homeland security enterprise, including New Zealand’s approach to resilience management. This chapter contextualizes the analysis by framing what resilience is, how it is operationalized and measured, and how it applies in the public safety context.

Chapter II provides details on the research design, which is a comparative content analysis of existing public safety doctrine in the context of New Zealand’s resilience management framework. It addresses the research questions and research design, explains the analysis framework and tool, and describes why the research approach is appropriate, as well as its limitations and implications.

Chapter III is the first part of the analysis, analyzing two of the three attributes of organizational resilience—situational awareness and management of keystone vulnerabilities—as defined by New Zealand’s resilience management framework. It reviews existing public safety doctrine from Texas, Virginia, and Nebraska and provides

overall findings related to these two resilience attributes in state-level public safety doctrine.

Chapter IV is the second part of the analysis, analyzing the third attribute of organizational resilience—adaptive capacity. It examines after action reports from the 2009 American Civic Center shooting in Broome County, New York; the 2013 Boston Marathon bombings, and the 2014 wildfires in San Diego County. This chapter also provides overall findings regarding the adaptive capacity resilience attribute, and how its components are, or are not, reflected in the learning process that creates and shares after action reports and lessons learned.

Chapter V provides overall findings from the research and analysis as a whole and identifies areas for additional study.

### **C. LITERATURE REVIEW**

Based on its own doctrine, the homeland security enterprise clearly promotes resilience, yet there is little literature on resilience at the organizational level. Even less literature is available regarding organizational-level resilience in public safety agencies—key organizations within the homeland security realm. If a resilient homeland security enterprise is the goal, as it seems to be, it cannot be accomplished without resiliency throughout the enterprise’s various components.

This literature review examines the body of existing research and doctrine that can help public safety agencies understand resilience within their organizations. To accomplish this, the review is divided into five categories:

1. Defining Resilience
2. Resilience in the Homeland Security Enterprise
3. Resilience in Public Safety Doctrine
4. Organizational Resilience—Frameworks and Tools within the Homeland Security Enterprise
5. Organizational Resilience—Frameworks and Tools outside the Homeland Security Enterprise



## 1. Defining Resilience

There is a great deal of literature that examines what exactly resilience is, in a definitional sense. This section of the literature review focuses on some of the ways resilience is defined in the various related literatures.

Steven Flynn runs the Northeastern University Homeland Security program and is president of the Center for National Policy, where he focuses on resilience in the context of homeland security.<sup>4</sup> Flynn suggests the key to resilience is in our ability to learn from past incidents, acknowledge key vulnerabilities when they are revealed, and undertake reasonable measures to reduce them.<sup>5</sup> Flynn also identifies four factors for resilience in his book *America the Resilient: Defying Terrorism and Mitigating Natural Disasters*. These are a sustained commitment to:

1. **Robustness:** The ability to keep operating or to stay standing in the face of disaster, including investing in and maintaining elements of infrastructure to withstand low-probability but high-consequence events.
2. **Resourcefulness:** Skillfully managing a disaster once it unfolds, to include identifying options, prioritizing what should be done to both control damage and begin mitigating it, and communicating decisions to the people who will implement them. Resourcefulness is dependent primarily on people and not technology.
3. **Rapid recovery:** The capacity to get things back to normal as quickly as possible after a disaster—reliant on carefully drafted contingency plans, competent emergency operations, and the means to get the right people and resources to the right place.
4. **Absorption:** Resilience means absorbing the new lessons that can be drawn from a catastrophe, and making pragmatic changes to improve robustness, resourcefulness, and recovery capabilities before the next crisis.<sup>6</sup>

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<sup>4</sup> “Stephen E. Flynn, PhD,” Stanford Center for International Security and Cooperation, accessed August 30, 2015, [http://cisac.fsi.stanford.edu/people/stephen\\_e\\_flynn?sm\\_au=iVVLnZpsNR51JFS0](http://cisac.fsi.stanford.edu/people/stephen_e_flynn?sm_au=iVVLnZpsNR51JFS0).

<sup>5</sup> Stephen Flynn, *The Edge of Disaster* (New York: Random House, 2007), 7.

<sup>6</sup> “Stephen Flynn,” New York University, accessed August 31, 2015, [http://www.nyu.edu/intercep/lapietra/Flynn\\_AmericatheResilient.pdf](http://www.nyu.edu/intercep/lapietra/Flynn_AmericatheResilient.pdf).

In the book *Resilience: Why Things Bounce Back*, Andrew Zolli and Ann Marie Healy borrow from the fields of ecology and sociology to define resilience as “the capacity of a system, enterprise or person to maintain its core purpose and integrity in the face of dramatically changed circumstances.”<sup>7</sup> They further define two essential aspects of resilience: continuity and recovery in the face of change.<sup>8</sup>

Sociology Professor and Director of the Natural Hazards Research Center at the University of Colorado Kathleen Tierney, and Director at MCEER<sup>9</sup> Michael Bruneau, wrote a paper on “conceptualizing and measuring resilience.” They claim that resilience “reflects a concern for improving the capacity of physical and human systems to respond to and recover from extreme events.”<sup>10</sup> Tierney and Bruneau suggest that the catastrophic consequences of Hurricane Katrina served as a catalyst for the prominence of resilience in the disaster research field.<sup>11</sup>

Julia Hillmann, a faculty member of the Business and Economics Department at Technische Universität Dresden, conducted a review of empirical research on organizational resilience.<sup>12</sup> Hillmann searched over 1,042 articles describing different definition components and concluded that organizational resilience is the “ability to anticipate risk and future trends (prepare/before); to understand the situation, to resist, and act thoughtfully (response/during); to recover fast, to adapt, and to renew or reinvent (recover/after); while effectively aligning operational with corporate strategies to be able to survive in turbulent and complex environments.”<sup>13</sup>

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<sup>7</sup> Andrew Zolli and Ann Marie Healy, *Resilience: Why Things Bounce Back* (New York: Simon and Schuster, 2012), 7.

<sup>8</sup> Ibid 7.

<sup>9</sup> The center was originally known as the Multidisciplinary Center for Earthquake Engineers and Research (MCEER). As their mission evolved they officially changed the name of the center to MCEER.

<sup>10</sup> Kathleen Tierney and Michel Bruneau, “Conceptualizing and Measuring Resilience: A Key to Disaster Loss Reduction,” *TR News* 250 (May–June 2007):14.

<sup>11</sup> Ibid.

<sup>12</sup> Julia Hillmann, “Empirical Research on Organizational Resilience: How Far Have We Come?” paper presented at the Autumn Meeting of the Section Sustainability Management of the German Academic Association for Business Research, Wien, Austria, October 7–8, 2013.

<sup>13</sup> Ibid.

## 2. Resilience in the Homeland Security Enterprise

While resilience is defined and examined throughout the literature in a variety of ways, this section focuses on resilience in the context of the homeland security enterprise. It specifically focuses on resilience at the federal and state level, two of the major organizational levels at which the enterprise operates.

Resilience has emerged as a prominent term throughout federal and state homeland security and emergency preparedness doctrine. Such doctrine serves as the basis of many homeland security and emergency preparedness programs and activities throughout the nation. For example, the Homeland Security Grant Program (HSGP), the predominant funding source for state and high-risk urban areas' homeland security activities, requires compliance with presidential policy directives and national frameworks such as the National Preparedness Goal (NPG), and requires the development of state and urban area strategies in which all grant-funding activities must align.<sup>14</sup>

In 2011, Presidential Policy Directive 8 (PPD-8) was released, placing a prominent focus on resilience.<sup>15</sup> PPD-8 replaced the previous administration's Homeland Security Presidential Directive 8 (HSPD-8), which did not mention resilience.<sup>16</sup> PPD-8 directs the federal government's actions in order to strengthen U.S. security and resilience and facilitate an integrated capabilities-based approach to preparedness.<sup>17</sup> To accomplish this, the directive required the development of the National Preparedness System and the NPG. In order to assess progress toward the NPG, the directive also requires an annual National Preparedness Report.<sup>18</sup>

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<sup>14</sup> "Notice of Funding Opportunity: Fiscal Year 2015 Homeland Security Grant Program," Department of Homeland Security, accessed October 14, 2015, [http://www.fema.gov/media-library-data/1429291822887-7f203c9296fde6160b727475532c7796/FY2015HSGP\\_NOFO\\_v3.pdf](http://www.fema.gov/media-library-data/1429291822887-7f203c9296fde6160b727475532c7796/FY2015HSGP_NOFO_v3.pdf).

<sup>15</sup> The White House, *Presidential Policy Directive /PPD-8: National Preparedness* (Washington, DC: The White House, 2011).

<sup>16</sup> The White House, *Homeland Security Presidential Directive 8/HSPD-8: National Preparedness* (Washington, DC: The White House, 2003).

<sup>17</sup> The White House, *PPD-8*.

<sup>18</sup> *Ibid.*

As directed, the September 2011 NPG announced 31 core capabilities, which DHS define as the “critical elements necessary for success.”<sup>19</sup> Several of the capabilities address resilience in some capacity. These include: supply chain integrity and security, long-term vulnerability reduction, risk and disaster resilience assessment, infrastructure systems, community resilience, and health and social services.<sup>20</sup> Just as PPD-8 replaced HSPD-8, the 31 capabilities replaced the Target Capabilities List, which did not address resilience.

State homeland security and emergency preparedness agencies have also incorporated resilience into their lexicon, planning, and doctrine. According to its mission statement, the California Governor’s Office for Emergency Services aims to “protect lives and property, build capabilities, and support our communities for a resilient California.”<sup>21</sup> Similarly, New York State’s 2014–2016 Homeland Security Strategy vision is for “a strong, secure and resilient New York State that is recognized as a national leader in homeland security and emergency management.”<sup>22</sup>

PPD-8 provided an official definition for resilience. It directs “that the term ‘resilience’ refers to the ability to adapt to changing conditions and withstand and rapidly recover from disruption due to emergencies.”<sup>23</sup> While the Target Capabilities List did not have capabilities that specifically addressed resilience, it did provide a definition, which was “our coping capacity to absorb events, adapt, respond to, and recover from its effects.”<sup>24</sup>

The *Texas Homeland Security Strategic Plan 2010–2015* argues that “resilience is much more than a community’s ability to bounce back after a disaster. It is the ability to function competently throughout a disaster situation and rapidly adapt to the new realities

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<sup>19</sup> Department of Homeland Security, *National Preparedness Goal*, 1.

<sup>20</sup> Ibid.

<sup>21</sup> “About Cal OES,” California Office of Emergency Services.

<sup>22</sup> “New York State Homeland Security Strategy: 2014–2016,” New York DHSES, 4.

<sup>23</sup> “Resilience,” Department of Homeland Security, accessed August 15, 2016, <http://www.dhs.gov/topic/resilience>.

<sup>24</sup> Department of Homeland Security, *Target Capabilities List: A Companion to the National Preparedness Guidelines* (Washington, DC: Department of Homeland Security, 2007), vii.

that a disaster creates. Resilience implies rapid adaptability on many fronts: restoration and provision of essential services, resumption of economic activity, occupation of desired domiciles, and resumption of social intercourse.”<sup>25</sup>

The New York 2100 Commission report, a post-Superstorm Sandy report, suggests resilience is “the ability of individuals, organizations, systems, and communities to bounce back more strongly from stresses and shocks. Resilience means creating diversity and redundancy in our systems and rewiring their interconnections, which enables their functioning even when individual parts fail.”<sup>26</sup>

The California Governor’s Office of Emergency Services defines resilience on their website as “the ability of an organization/community core business functions to rapidly adapt and respond to internal or dynamic changes, business opportunities, demands, disruptions, of threats.”<sup>27</sup>

While the term resilience is prominent throughout federal and state doctrine, there appears to be some confusion among homeland security professionals regarding what exactly resilience is. In a *Homeland Security Affairs* article, Jerome Kahan states, “Resilience is used in a variety of ways with different meanings by homeland security officials and in various official documents.”<sup>28</sup> Kahan’s literature review explored this statement by examining the various meanings and specific documents that are addressing resilience. From his review, it is apparent that, while his statement is accurate, the various meanings are not necessarily problematic. While there are variations in the aforementioned official homeland security documents, their definitions are not necessarily in conflict. Resilience is an abstract and overarching concept; slight variations in meaning throughout official documents should not be a cause for concern. The

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<sup>25</sup> State of Texas, *Texas Homeland Security Strategic Plan 2010–2015* (Austin, TX: State of Texas, 2015), 49.

<sup>26</sup> “Recommendations to Improve Strength and Resilience of the Empire State’s Infrastructure,” NYS 2100 Commission, accessed June 17, 2015, 7, <http://www.governor.ny.gov/sites/governor.ny.gov/files/archive/assets/documents/NYS2100.pdf>.

<sup>27</sup> “Continuity Planning,” California Office of Emergency Services, accessed June 17, 2015, <http://www.caloes.ca.gov/cal-oes-divisions/planning-preparedness/continuity-planning>.

<sup>28</sup> Jerome Kahan, “Resilience Redux: Buzzword or Basis for Homeland Security,” *Homeland Security Affairs* 11, article 2 (February 2015), <https://www.hsaj.org/articles/1308>.

documents all maintain key components, such as adaptability, rapid recovery, continuity of essential functions, and redundancy. These common components—along with other domain- or organization-specific components—can help organizations frame what resilience means to them.

### **3. Resilience in Public Safety Doctrine**

Understanding resilience in public safety doctrine is challenging. When dealing with public safety or national security agencies and problems, there is often only a small sample of publicly available documents from which to draw evidence and inferences. Therefore this section focuses on specific doctrine—continuity of operations (COOP) plans, homeland security strategic documents, and after action reports (AARs)—for which there is a sample, albeit a small one, of publicly available documents, as well as some established guidance for creating such doctrine.

#### ***a. Continuity of Operations (COOP) Plans***

In the federal homeland security enterprise, national continuity policy is a result of National Security Presidential Directive 51 (HSPD-51)/Homeland Security Presidential Directive 20 (HSPD-20), issued by President Bush in 2007.<sup>29</sup> The directive requires that all federal executive departments and agencies develop standardized continuity plans and provides guidance for states and local government and private sector organizations that are developing continuity plans.<sup>30</sup> Further, the directive gave DHS the responsibility to coordinate national continuity operations and enhance the nation’s continuity capability.<sup>31</sup>

The directive’s National Continuity Policy Implementation Plan required federal organizations to incorporate redundancy and resilience as a “means to an end.”<sup>32</sup> The ultimate goal, continuity, is achieved by identifying “national essential functions” (NEFs)

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<sup>29</sup> “Continuity of Operations,” FEMA, last updated August 11, 2015, <https://www.fema.gov/continuity-operations>.

<sup>30</sup> Ibid.

<sup>31</sup> Ibid.

<sup>32</sup> Ibid.

and ensuring those functions are either continued or resumed when day-to-day operations are disrupted. Further, the plan acknowledges the federal government’s relationship with state and local governments, and private sector stakeholders.<sup>33</sup>

For non-federal government entities, DHS released a “Continuity Plan Template for Non-Federal Governments” to provide a framework for creating a plan focusing on key elements addressed in federal doctrine, such as:

- Continuity Guidance Circular 1 (CGC 1)—*Continuity Guidance for Non-Federal Governments (States, Territories, Tribes, and Local Government Jurisdictions)*, dated July 2013 and
- Continuity Guidance Circular 2 (CGC 2)—*Continuity Guidance for Non-Federal Governments: Mission Essential Functions Identification Process (States, Territories, Tribes, and Local Government Jurisdictions)*, dated October 2013.<sup>34</sup>

At the state and local level, the federal government does not require creation or submission of COOP plans. That said, some states have taken the initiative to require them. For example, the Texas State Office of Risk Management requires state agencies to complete COOP plans within their labor code.<sup>35</sup> While not all states have dedicated statutes requiring COOP plans for state agencies, many provide COOP-related guidance for government and non-government entities via their public websites, such as California and New York (two states, as previously mentioned, that have built resilience into their strategic missions). This is a policy area, like many others, in which different states have vastly different focuses, capabilities, and levels of maturity in processes and programs.

Additionally, the Emergency Management Accreditation Program (EMAP), a voluntary program, requires that emergency management agencies seeking accreditation have COOP plans that contain the following elements:

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<sup>33</sup> Ibid.

<sup>34</sup> “Continuity Plan Template for Non-Federal Governments,” FEMA, September 2013, ii, <http://www.fema.gov/media-library-data/1389194323803-5d98dd1ec9f3af8ad15774b74a92bba5/Non-Federal%20Continuity%20Plan%20Template.pdf>.

<sup>35</sup> “Continuity of Operations Planning,” State Office of Risk Management, accessed July 28, 2016, <https://www.sorm.state.tx.us/coop>.

- purpose, scope, and/or goals and objectives;
- authority;
- situation and assumptions;
- functional roles and responsibilities;
- logistics support to implement the plan;
- concept of operations; and
- plan maintenance.<sup>36</sup>

The federal continuity guidance, along with the element requirements outlined in EMAP, highlight a set of minimum baseline standards for public safety agencies to include in COOP plans.

***b. Homeland Security Strategies***

In March 2005, DHS issued the Interim National Preparedness Goal and the National Preparedness Guidance.<sup>37</sup> From this, the *State and Urban Area Homeland Security Strategy Guidance on Aligning Strategies* was released in July 2005. This document required that states and DHS-designated urban areas complete and submit such strategies no later than September 2005, and outlined minimum requirements for the strategies.<sup>38</sup> Strategies, for example, must address the four mission areas defined in the NPG—prevent, protect, respond, and recover—as well as the seven National Priorities.<sup>39</sup> The guidance document also required state and urban areas to tailor and update their strategies on a regular, albeit not specific, basis.<sup>40</sup>

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<sup>36</sup> “Continuity of Operations Plan (COOP) Webinar,” Maryland Emergency Management Agency, March 31, 2015, 37, [http://mema.maryland.gov/community/Documents/COOP\\_Webinar\\_31\\_MAR\\_15.pdf?\\_sm\\_au=iVVHQ64CBNkBVpMH](http://mema.maryland.gov/community/Documents/COOP_Webinar_31_MAR_15.pdf?_sm_au=iVVHQ64CBNkBVpMH).

<sup>37</sup> Department of Homeland Security, *State and Urban Area Homeland Security Strategy: Guidance on Aligning Strategies with the National Preparedness Goal* (Washington, DC: Department of Homeland Security, 2005), 3.

<sup>38</sup> *Ibid.*, 2. Strategies were submitted to the former Office of Domestic Preparedness.

<sup>39</sup> *Ibid.*

<sup>40</sup> *Ibid.*, 8.



The 2004–2006 era strategies were predominately terrorism focused, and DHS encouraged that updates include broader threats and hazards to follow a capabilities-based planning approach.<sup>41</sup> It is noteworthy that the State and Urban Area Homeland Security Strategy itself has not been updated since 2005 despite update requirements in federal grant guidance. Beginning in 2012, DHS and its component the Federal Emergency Management Agency (FEMA) required all grantees to develop and maintain a Threat and Hazard Identification and Risk Assessment (THIRA) in order to remain eligible for the Homeland Security Grant Program (HSGP), shifting the requirement from strategies to the THIRA.<sup>42</sup> In April 2012, FEMA released *Comprehensive Preparedness Guide 201* for states and urban areas; the guidance purports that a THIRA must include a way to assess risk and impacts in the context of the NPG’s core capabilities.<sup>43</sup> The move from strategies to THIRA—which, despite its title, is largely a capability assessment tool—may well have (intentionally or not) de-prioritized such strategy documents, which tended to have a broader focus (beyond core capabilities) and a more forward-looking approach (as opposed to assessing current states). The long-term effects of this shift on state-level homeland security strategies remain to be seen.

**c. After Action Reports**

AARs are widely considered a best practice in the preparedness and emergency management fields. Despite this general consensus, however, there is less agreement concerning how to apply the reports. In the article “Lessons We Don’t Learn,” authors Donahue and Tuohy state that “there is no universally accepted approach to the development or content of reports.”<sup>44</sup> They suggest that by identifying and understanding the challenges first responders face during an incident, responders can be more receptive

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<sup>41</sup> Ibid.

<sup>42</sup> Department of Homeland Security Office of the Inspector General, *New York’s Management of Homeland Security Grant Program Awards for Fiscal Years 2010–12* (OIG-15-107) (Washington, DC: Department of Homeland Security, 2015), 5, [https://www.oig.dhs.gov/assets/Mgmt/2015/OIG\\_15-107\\_Jun15.pdf](https://www.oig.dhs.gov/assets/Mgmt/2015/OIG_15-107_Jun15.pdf).

<sup>43</sup> Ibid., 5.

<sup>44</sup> Amy K. Donahue and Robert V. Tuohy, “Lessons We Don’t Learn,” *Homeland Security Affairs* 2, no. 2 (July 2006): 12.

to addressing these challenges in planning and training processes, as well as to changing their behavior and overall ability to improve.<sup>45</sup>

In “Text Analysis of After Action Reports to Support Improved Emergency Response Planning,” authors Faith, Jackson, and Willis analyzed 70 AARs and found a variety of common failures in emergency responses, such as a lack of equipment and problems with training and communication.<sup>46</sup> They claim that if the response agencies had a systematic way to incorporate the lessons learned from previous events, they could reduce these failures. If AARs were standardized and included causes and consequence of failures, then they would have great utility as a data source.<sup>47</sup> Whether or not these particular claims are correct, it seems clear that AARs (and the process around them) are important and underutilized, and have the potential to be used more effectively.

#### **4. Organizational Resilience—Frameworks and Tools within the Homeland Security Enterprise**

This section explores two approaches for examining resilience in a homeland security context in the United States. These approaches originate from two organizations: MCEER and Argonne National Laboratory, which are both well-known, established research and analysis institutions within the homeland security enterprise. Both approaches are helpful in understanding components of resilience; however, both are also more germane in the context of infrastructure and have less utility at the organization level.

In its current form, the MCEER framework is too strategic, or too high-level, to be directly useful to organizations. That is not to say there is no place for such strategic frameworks in resilience; rather, in order to operationalize resilience, narrower objectives and metrics must be developed before such frameworks will work for organizations that wish to better understand their resilience levels. The Argonne National Laboratory

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<sup>45</sup> Ibid., 2.

<sup>46</sup> Kay Sullivan Faith, Brian A. Jackson, and Henry Willis, “Text Analysis of After Action Reports to Support Improved Emergency Response Planning,” *Journal of Homeland Security and Emergency Management* 8, no. 1 (2011): 1–16.

<sup>47</sup> Ibid.

framework is a solid approach to assessing resilience, but the mechanism used to gather data is potentially problematic—or infeasible—and the measurements of resilience are difficult to understand and communicate. While these two approaches have shortcomings for assessing organizational resilience in public safety agencies, they provide a solid understanding of what has been done, what works well and what does not, and why or why not. This, in turn, helps inform strategies for better understanding resilience. Both are valuable tools for their purposes, and show that systematic thinking about resilience is feasible, and that it is currently occurring in various areas.

*a. MCEER's Resilience Framework*

MCEER is a national center for excellence comprising researchers and industry partners, aiming to “equip communities to become more disaster resilient in the face of earthquakes and other extreme events.”<sup>48</sup> MCEER developed a resilience framework as a foundation for disaster resilience among organizations and communities. The organization’s approach suggests that certain characteristics make the concept of resilience more tangible and measureable; through these characteristics, resilience can be enhanced. The characteristics include reduced probability of failure (i.e., the reduced likelihood of damage and failure to critical infrastructure, systems, and components), reduced consequences from failures, and reduced time to recover.<sup>49</sup>

MCEER considers the “The Four ‘Rs’” the fundamental properties of resilience. These are:

1. Robustness—strength, or the ability of elements, systems, and other units of analysis to withstand a given level of stress or demand without suffering degradation or loss of function;
2. Redundancy—the extent to which elements, systems, or other units of analysis exist that are substitutable, i.e., capable of satisfying functional requirements in the event of disruption, degradation, or loss of function;
3. Resourcefulness—the capacity to identify problems, establish priorities and mobilize resources when conditions exist that threaten to disrupt some element, system, or other unit of analysis; and

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<sup>48</sup> “About MCEER,” accessed June 18, 2015, <http://www.buffalo.edu/mceer/about.html>.

<sup>49</sup> Ibid.

4. Rapidity—the capacity to meet priorities and achieve goals in a timely manner in order to contain losses and avoid future disruption.<sup>50</sup>

MCEER defines broad concepts to understand resilience; it acknowledges that the challenge is for organizations and communities to build upon these four “Rs” and develop specific metrics, objectives, and actions to assess and improve upon the current state of each.<sup>51</sup> In this sense, MCEER acknowledges that they have not tackled the problem of operationalizing these concepts.

Although the MCEER approach provides a suggested framework, it lacks the metrics needed to assess resilience; instead, it leaves that responsibility to organizations themselves. This may work well for organizations with strong internal analytic capabilities and expertise, which is a fairly unusual set of organizational characteristics. Perhaps the framework is trying to tackle too many objectives, and as such the individual pieces—including the pivotal organizational piece—are not well defined. This framework may be better suited for more complex systems or large jurisdictions (states or nations) rather than organizations.

***b. Argonne National Laboratory Resilience Framework***

Argonne National Laboratory has developed a methodology to assess resilience at the asset or facility level, suggesting that “critical infrastructure resilience is important both in its own right and because of its implications for community/regional resilience.”<sup>52</sup> In 2010, Argonne National Laboratory began to operationalize resilience by developing a proposed approach to measure the resilience of critical infrastructure.<sup>53</sup>

In order to accomplish this, Argonne National Laboratory partnered with the DHS Protective Security Coordination Division to develop a Resilience Index based on an approach from the National Infrastructure Advisory Council considering three

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<sup>50</sup> MCEER, *MCEER’s Resilience Framework: Resilience Concept Drives Development of New Knowledge, Tools, & Technologies* (Buffalo, NY: MCEER, 2006), 2, [http://mceer.buffalo.edu/research/resilience/resilience\\_10-24-06.pdf](http://mceer.buffalo.edu/research/resilience/resilience_10-24-06.pdf).

<sup>51</sup> *Ibid.*, 2.

<sup>52</sup> L. Carlson et al., *Resilience: Theory and Application* (ANL/DIS-12-1) (Oak Ridge, TN: Argonne National Laboratory, 2012), vii.

<sup>53</sup> *Ibid.*, 9.

components: robustness, resourcefulness, and rapid recovery.<sup>54</sup> Utilizing data collected from the federal DHS Protective Security Advisors Infrastructure Survey Tool, Argonne National Laboratory developed a methodology that provided a relative weight to the three components, resulting in an overall Resilience Index number.<sup>55</sup> Their framework leans on their definition of resilience—they believe that key terms in this definition are directly connected to the actions organizations must take in order to be resilient (see Figure 1).

Anticipate	Resist	Absorb	Respond	Adapt	Recover
<b>Preparedness</b>	<b>Mitigation</b>		<b>Response</b>		<b>Recovery</b>
Activities taken by an entity to define the hazard environment to which it's subject.	Activities taken prior to an event to reduce the severity or consequences of a hazard.		Immediate or ongoing activities, tasks programs, or systems that have been undertaken or developed to manage the adverse impact of an event.		Activities and programs designed to effectively and efficiently return conditions to a level that is acceptable to the entity.

Figure 1. Argonne National Laboratory's Framework<sup>56</sup>

Because the Argonne National Laboratory approach fits FEMA's phases of emergency management, it is appealing to the homeland security enterprise.<sup>57</sup> That said, utilizing the data collected in the DHS Infrastructure Survey Tool to assess broader questions of organizational resilience (or even facility resilience) is problematic for two important reasons.

First, the original intent of DHS' Infrastructure Survey Tool was security focused. There is an argument to be made that this was the right choice, and that it should have remained consistent to this intent. In 2012, Argonne National Laboratory proposed changes to the Infrastructure Survey Tool to better align with their definition of resilience

<sup>54</sup> Ibid., 21.

<sup>55</sup> R. E. Fisher et al., *Constructing a Resilience Index for Enhanced Critical Infrastructure Program* (ANL/DIS-10-9) (Oak Ridge, TN: Argonne National Laboratory, 2010), 1.

<sup>56</sup> Carlson et al., *Resilience: Theory and Application*, 22.

<sup>57</sup> Bruce R. Lindsay, *Federal Emergency Management: A Brief Introduction* (CRS Report No. R42845) (Washington, DC: Congressional Research Service, 2012), 2.

and therefore result in a more complete calculation of the Resilience Index.<sup>58</sup> Rather than creating a new mechanism to achieve this goal, they suggested modifying an existing tool designed for one purpose (security) to achieve another (resilience). While streamlining data collection can be beneficial at times, this was not one of those times—the modifications further complicated an already complicated process. As with many tools repurposed from one goal to another, it maintains elements of its former life and is left with a fractured set of priorities for multiple disparate purposes.

Second, there are concerns with the process and utility of the Infrastructure Survey Tool.<sup>59</sup> In a Government Accountability Office report, a DHS protective security advisor claimed,

the program is broken in regard to timely completion of reports and deliverables [protective measures and resiliency dashboards] for the asset owners/operators. I have yet to receive anything from [a vulnerability assessment conducted several months ago]. I have not even received the draft report for review, nor the dashboard. This creates a big credibility problem for me with my stakeholders who are looking for the results.<sup>60</sup>

The formulas Argonne National Laboratory uses to weight factors that contribute to resilience, while transparent, are not very useful to those who are not statisticians or quantitatively minded risk professionals. The illustration in Figure 2 shows how Argonne National Laboratory obtains a planning index.

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<sup>58</sup> Carlson et al., *Resilience: Theory and Application*, 19.

<sup>59</sup> Government Accountability Office, *Critical Infrastructure Protection: DHS Could Better Manage Security Surveys and Vulnerability Assessments* (GAO-12-378) (Washington, DC: Government Accountability Office, 2012).

<sup>60</sup> *Ibid.*, 28.

The Planning Index (PII) (Level 2) is obtained by using Equation 4:

$$PII = \sum_{i=1}^4 d_i \times W_i \quad (4)$$

where:

$PII$  = Planning Index, Level 2 (ranging from 0 to 100);

$d_i$  = scaling constant (weight) indicating the relative importance of possibility  $i$  ( $i = 1,2,3,4$ ) for planning; and

$W_i$  = component of component  $i$  of planning

Figure 2. Planning Index from Argonne National Laboratory<sup>61</sup>

Although the illustration shows only one formula, several indexes are aggregated to provide an overall assessment of resilience.<sup>62</sup> While these measurements may be useful to Argonne National Laboratory, their utility to organizations focused on planning and improving doctrine is questionable. It would take a considerable—and often unfeasible—amount of time to understand the methodology; many organizations have already indicated “not having the time or resources” as a frequent reason for declining to participate in the DHS security survey.<sup>63</sup> One of the tensions that affects many assessment frameworks is the contrasting pulls of accurately representing complex issues while still retaining the kind of usability that enables it to be accepted by organizations.

Both the MCEER and Argonne National Laboratory approaches can help inform ways to think about resilience, but neither offers ways in which organizations can meaningfully operationalize resilience. The first approach by MCEER highlights that, in addition to a strategic framework itself, objectives and metrics need to be developed to support the framework in order for it to be useful at an operational level. The second approach provides an excellent framework but highlights the need for a less complicated process to gather and measure data, and a need to make end products—both tools and data presentations—that are usable by the end-consumers.

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<sup>61</sup> Carlson et al., *Resilience: Theory and Application*, 53.

<sup>62</sup> Ibid.

<sup>63</sup> Government Accountability Office, *Critical Infrastructure Protection*, 60.

## **5. Organizational Resilience—Frameworks and Tools outside of the Homeland Security Enterprise**

The previous section focused on approaches to resilience in the homeland security enterprise on a critical infrastructure or systems level, rather than at the organizational level. This section focuses on an engineering-based and a private sector-based framework for examining resilience at the organizational level. It also provides insight into how New Zealand has approached understanding resilience and explores the concept of resilience management from the Resilient Organisations (ResOrgs) program.

### ***a. Engineering-Based Framework***

At the 2013 Annual Resilience Engineering Symposium sponsored by the Resilience Engineering Association, Patricia Longstaff, Thomans Koslowski, and Will Geoghegan presented the paper, “Translating Resilience: A Framework to Enhance Communication and Implementation.”<sup>64</sup> The authors are not engineers, but are academics from Syracuse University and the University of Freiburg Germany.<sup>65</sup> Their paper briefly discusses the rise in popularity of the term resilience, acknowledging it as a new buzzword with little validity; the authors argue that increased popularity of the term signals the need to address uncertainty and variability, which result from the increasingly complex and interconnected systems in which we operate. They also argue that there is not a holistically agreed-upon definition of resilience, which creates difficulties in the short term. These authors propose a multi-disciplinary resilience framework addressing four types of resilience.:

- The capacity to rebound and recover,
- The capability to maintain a desirable state,
- The capacity of the systems to withstand stress, and
- The capability to adapt and thrive.<sup>66</sup>

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<sup>64</sup> Patricia H. Longstaff, Thomans G. Koslowski, and Will Geoghegan, “Translating Resilience: A Framework to Enhance Communication and Implementation,” paper presented at the fifth annual Resilience Engineering International Symposium, Soesterberg, Netherlands, June 2013.

<sup>65</sup> Ibid., 1.

<sup>66</sup> Ibid.



Overall, the paper's structure and its exploration of the term's prominence in academic literature are well thought-out and consistent with prior research. However, the paper overuses the phrase "bounce back" when discussing resilience and does not provide the authors' own definition within the body of the paper. They have developed a framework that defines an outcome for resilience without truly committing to a definition of the term; it is difficult to fully trust a framework that does not definitively define what exactly is being framed.

The four "types" of resilience listed in the framework can be further explored to assess their applicability to public safety organizations. It is noteworthy that the article did not mention the intended audience for its framework—communities, organizations, jurisdictions, individuals, etc. The intention to make the framework appeal to both ecologists and engineers is disconcerting. To be of value, the framework would need to be expanded and tailored to the public safety enterprise.

***b. "Building Resilient Organizational" Framework***

Private sector business consultant Dean Robb created a framework for building resilient organizations.<sup>67</sup> In his context, a resilient organization is defined as one that "is able to *create* structure, and to *dissolve* it; provide *safety* (not necessarily security or stability) in the midst of change; manage the emotional consequences of continuous transformation and change: anxiety and grief; [and] learn, develop and grow."<sup>68</sup> Robb argues that a resilient organization is a hybrid entity that integrates two sub-systems, "the performance system" and the "adaptive system," further broken down into three categories: architecture, skills, and culture. He concludes his article indicating that a resilient organization occurs over an intended period of time and the framework is an "idealized template that may never be achieved in fullness."<sup>69</sup>

This article was written by a private sector business consultant and geared toward profit-driven private entities. Its excessive use of business "buzzwords" make its

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<sup>67</sup> Dean Robb, "Building Resilient Organizations," *OD Practitioner* 32, no 3 (2000): 27–32.

<sup>68</sup> *Ibid.*, 27.

<sup>69</sup> *Ibid.*, 32.

framework, as is, of little appeal to public safety organizations. By the author's own admission, the framework is too idealistic. That said, it does provide some value in defining a resilient organization.

*c. New Zealand's Resilient Organisations and Management Process*

In New Zealand, the Ministry of Civil Defence Emergency Management (CDEM) is a business unit of the Department of the Prime Minister and Cabinet.<sup>70</sup> The CDEM is responsible for the articulating the Crown's vision of a "resilient New Zealand: communities understanding and managing their hazards."<sup>71</sup> The CDEM "provides policy advice to government, supports CDEM planning and operations, ensures there is coordination at local, regional and national levels, and manages the central government response for large-scale civil defense emergencies that are beyond the capacity of local authorities."<sup>72</sup> The CDEM Act of 2002 outlines the authorities and responsibilities for emergency management within New Zealand.<sup>73</sup>

New Zealand has made resilience at the organizational level a priority. One way the country is achieving its vision is by funding the Resilient Organisations (ResOrgs) program, a multi-university research partnership focused on factors that make organizations resilient to crises.<sup>74</sup> Funding is received from the New Zealand Ministry of Business, Innovation and Employment; the CDEM; and a variety of other government, private sector, and not-for-profit entities.<sup>75</sup>

Researchers affiliated with ResOrgs authored several papers and articles on organizational resilience, to include *Resilience Management: A Framework for Assessing*

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<sup>70</sup> "About the Ministry," Ministry of Civil Defence and Emergency Management, accessed July 6, 2016, <http://www.civildefence.govt.nz/about/about-the-ministry>.

<sup>71</sup> Natural Hazards Research Platform, *Interim Research Strategy* (Lower Hutt, New Zealand: NHRP, 2009), 2.

<sup>72</sup> "About the Ministry," Ministry of Civil Defence and Emergency Management.

<sup>73</sup> Civil Defence Emergency Management Act of 2002, New Zealand P.A. 2002, no. 33, October 2002, <http://www.legislation.govt.nz/act/public/2002/0033/latest/DLM149789.html>.

<sup>74</sup> "About Resilient Organisations," accessed July 6, 2015, <http://www.resorgs.org.nz/about-us.html>.

<sup>75</sup> "Our Funders," Resilient Organisations, accessed July 6, 2016, <http://www.resorgs.org.nz/our-funders.html>.

*and Improving the Resilience of Organisations* and “Facilitated Process for Improving Organizational Resilience.”<sup>76</sup> Both pieces use the same framework and were written to provide a detailed definition of organizational resilience and a way to address resilience issues through a process they call “resilience management.”<sup>77</sup> They claim that there is an increased demand for organizations to “exhibit high reliability in the face of adversity...decision makers must address not only the crises that they know will happen, but also those they cannot foresee.”<sup>78</sup> The authors argue that building more resilient organizations is “complicated by an inability to translate the concept of resilience into tangible working constructs.”<sup>79</sup> Their process is built upon their three principal attributes of resilience: situational awareness, management of vulnerability, and adaptive capacity. Organizations that display these characteristics (and their subcomponents), the authors explain, are more resilient than those that do not.

The authors developed the process of resilience management in conjunction with, and tested by, ten case study organizations selected to represent a wide variety of New Zealand businesses. There was variety in terms of organizational structure, size (from 8 to 5,000 employees), industry, and sectors (both public and private).<sup>80</sup> Some were locally based programs that receive—and to some extent rely on—government funding, while others had a broader geographical footprint, were governed by a board, and/or received funding from private stakeholders or investors.<sup>81</sup> Only eight of the ten organizations participated fully in the study from start to finish, though it is unclear why two organizations failed to complete the study.<sup>82</sup>

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<sup>76</sup> Sonia McManus et al., *Resilience Management: A Framework of Assessing and Improving the Resilience of Organisations* (Christchurch, New Zealand: Resilient Organisations Programme, 2007); Sonia McManus et al., “Facilitated Process for Improving Organizational Resilience,” *Natural Hazards Review* 9 no. 2 (May 2008): 81–90, doi: 10.1061/(ASCE)1527-6988(2008)9:2(81).

<sup>77</sup> McManus et al., *Resilience Management*, 85.

<sup>78</sup> *Ibid.*, ii.

<sup>79</sup> *Ibid.*, 81.

<sup>80</sup> *Ibid.*, 87.

<sup>81</sup> *Ibid.*

<sup>82</sup> *Ibid.*

Overall feedback from the case study was positive. Moving forward, recommendations from the participating organizations included the need for a “more rigid and quantitative framework for assessing resilience.”<sup>83</sup> They also suggested a maturity model and scale of resilience, stating that if they are to compare themselves or other organizations in terms of resilience, they must first clearly determine what a truly resilient organization looks like.<sup>84</sup>

Armed with the case study results, the ResOrgs researchers put their concept of resilience management into practice.<sup>85</sup> The authors suggest that there are challenges to translate resilience, as a concept, into working constructs for organizations, and that resilience has a tendency to be viewed as a crisis or emergency management issue rather than a day-to-day operational construct.<sup>86</sup> As such, they piloted operationalizing their resilience management approach to their case study organizations via a facilitated process in attempt to “provide practical tools to for achieving improved resilience.”<sup>87</sup>

Post-study discussions between the researchers and “key decision makers” in the eight fully participating organizations showed that the organizations found value in the resilience management process, adopted recommendations made throughout the process, and engaged in additional resilience management activities outside of the study.<sup>88</sup> Researchers found “the use of specific planning, such as risk management and business continuity planning, together with the ability to link these plans and test them using exercises, are also significant indicators of resilience.”<sup>89</sup> Further, the researchers concluded that factors displayed by organizations such as “silo mentality, poor communication and relationships with stakeholders and inflexible and uncreative

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<sup>83</sup> Ibid., 81.

<sup>84</sup> Ibid., 87.

<sup>85</sup> McManus et al., “Facilitated Process,” 87.

<sup>86</sup> Ibid., 81.

<sup>87</sup> Ibid.

<sup>88</sup> Ibid., 87.

<sup>89</sup> Ibid., 88.

decision making” had significant negative impacts on the organization’s resilience overall.<sup>90</sup>

#### **D. CONCLUSION**

There is a wide variety of literature available explaining different definitions of resilience, and how it affects organizations. There are also a variety of frameworks and tools to help understand resilience in a variety of contexts—in existing doctrine, at different levels (i.e., organizational, systems, infrastructure), and in different countries. While conducting the literature review, it became apparent that it is possible to use existing doctrine from public safety agencies and frameworks that are available and applicable to better understand public safety agencies’ organizational resilience. Much of what has been done by others has utility to public safety agencies. Rather than starting from scratch, there is value in leveraging what public safety agencies have already created, from a doctrine perspective.

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<sup>90</sup> Ibid., 88.

## II. RESEARCH DESIGN

Leaning on best discovered practices from existing literature, this thesis aimed to answer the following questions:

- How can existing public safety doctrine contribute to an understanding of the organizational resilience of public safety agencies?
- How can after action reports (AARs) and their resultant learning process contribute to an understanding of adaptive capacity?

To answer the research questions, the thesis applied New Zealand's resilience management framework to public safety agencies by analyzing their plans, strategies, and AARs. Researchers in the Resilient Organisations Programme, a multi-university partnership funded by the New Zealand government, developed this framework in 2007 to assess and improve their organizations' resilience.<sup>91</sup>

The New Zealand framework was selected for several reasons. Namely, other available frameworks were not designed for organizational-level resilience; they were, instead, designed for critical infrastructure systems, community-level resilience, or other levels of analysis. The New Zealand framework can be tailored to address resilience within public safety agencies, such as organizational components, and facilitates vulnerability assessment—aspects that were absent in other frameworks.

### A. RESILIENCE MANAGEMENT FRAMEWORK

The three attributes of New Zealand's resilience management framework are situational awareness, management of keystone vulnerabilities, and adaptive capacity. Its creators suggest that “a resilient organisation has three main qualities above a non-resilient organization:

- A greater awareness of itself, its key stakeholders and the environment within which it conducts its business.

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<sup>91</sup> McManus et al., *Resilience Management*.

- An increased knowledge of its keystone vulnerabilities, and the impacts that those vulnerabilities could have on the organisation; both negative and positive.
- The ability to adapt to changed situations with new and innovative solutions and/or the ability to adapt the tools that it already has to cope with new and unforeseen situations.”<sup>92</sup>

These three attributes, along with their indicators, were analyzed in the public safety doctrine documents.

## B. RESILIENCE INDICATORS

The resilience management framework further breaks the three attributes of resilience into fifteen generic resilience indicators (see Figure 3).<sup>93</sup> Its creators assert that these indicators represent and apply to all the organizations in their study.

Resilience Indicators					
Situation Awareness		Management of Keystone Vulnerabilities		Adaptive Capacity	
SA <sub>1</sub>	Roles and Responsibilities	KV <sub>1</sub>	Planning Strategies	AC <sub>1</sub>	Silo Mentality
SA <sub>2</sub>	Understanding of Hazards and Consequences	KV <sub>2</sub>	Participation in Exercises	AC <sub>2</sub>	Communications and Relationships
SA <sub>3</sub>	Connectivity Awareness	KV <sub>3</sub>	Capability and Capacity of Internal Resources	AC <sub>3</sub>	Strategic Vision and Outcome Expectancy
SA <sub>4</sub>	Insurance Awareness	KV <sub>4</sub>	Capability and Capacity of External Resources	AC <sub>4</sub>	Information and Knowledge
SA <sub>5</sub>	Recovery Priorities	KV <sub>5</sub>	Organisational Connectivity	AC <sub>5</sub>	Leadership, Management and Governance Structures

Figure 3. Resilience Indicators<sup>94</sup>

<sup>92</sup> Ibid., 3.

<sup>93</sup> Ibid., ii.

<sup>94</sup> Ibid.

## (1) Situational Awareness

The situational awareness indicators are: roles and responsibilities, understanding hazards and consequences, connectivity awareness, insurance awareness, and recovery priorities.<sup>95</sup> *Roles and responsibilities* refers to individuals understanding their own roles and the roles of others within the organization. *Understanding hazards and consequences* focuses on organizations comprehensively understanding the variety of hazards to which they are vulnerable. *Connectivity awareness* focuses on an organization's understanding of its immediate operating environment as well as its key customers, suppliers, and others to whom it is critically linked. *Insurance awareness* refers to business interruption insurance or the awareness of other available insurance products and potential aid options. Finally, the *recovery priorities* indicator refers to understanding business requirements and identifying recovery priorities in the event of a crisis.<sup>96</sup>

## (2) Management of Keystone Vulnerabilities

The management of keystone vulnerabilities resilience indicators are: planning strategies, participation in exercises, the capability and capacity of internal resources, the capability and capacity of external resources, and organizational connectivity.<sup>97</sup> *Planning strategies* encompasses the risk identification process and engagement in emergency and recovery planning. *Participation in exercises* specifically refers to exercises as a part of regular planning efforts.<sup>98</sup>

In the *capability and capacity of internal resources* indicator, internal resources are divided into three components: physical, human, and process resources.<sup>99</sup> Buildings, internal services, and critical components and equipment are the physical resources. Human resources specifically refer to the capability and capacity of the organization's

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<sup>95</sup> Ibid., iii.

<sup>96</sup> Ibid., 20–23.

<sup>97</sup> Ibid., iii.

<sup>98</sup> Ibid., 24–25.

<sup>99</sup> Ibid., 26.



employees, while process resources refer to the organization's economic and administrative resources.<sup>100</sup>

The *capability and capacity of internal resources* indicator is closely related to the organization's awareness of its connectivity with key stakeholders (*connectivity awareness* in the previous set of indicators). In crisis situations this would include stakeholders important from a response and recovery perspective, but also includes an appreciation of the services and supply networks—such as utilities and supplies of essential goods—upon which organizations rely.<sup>101</sup> Finally, *organizational connectivity* refers to the relationships with other organizations such as contractors, suppliers, consultants, etc., important for both day-to-day operations and crisis situations <sup>102</sup>

### (3) Adaptive Capacity

The adaptive capacity attribute is divided into the following resilience indicators: silo mentality; communications and relationships; strategic vision of outcome expectancy; information and knowledge; and leadership, management, and governance structure.<sup>103</sup> The *silo mentality* refers to a decentralized and individualized approach to achieving goals with little strategic understanding of the organization's overall vision.<sup>104</sup> The *communications and relationships* indicator's effectiveness depends on the aspects of the *silo mentality* indicator. It is imperative for organizations to have mutually respected relationships and effective and redundant communication pathways.<sup>105</sup> The *strategic vision of outcome expectancy* refers to a clear vision statement or otherwise defined purpose that underpins an organization's operations.<sup>106</sup> The *information and knowledge* indicator is about sharing information, including the information's format and

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<sup>100</sup> Ibid.

<sup>101</sup> Ibid., 28–29.

<sup>102</sup> Ibid., 30.

<sup>103</sup> Ibid., iii.

<sup>104</sup> Ibid., 30.

<sup>105</sup> Ibid., 31.

<sup>106</sup> Ibid., 33.

how it is shared.<sup>107</sup> Finally, the framework creators argue that the *leadership, management, and governance structure* indicator is “one of the most important features for adaptive capacity and overall resilience.”<sup>108</sup>

### C. SAMPLE OF PUBLIC SAFETY DOCTRINE

The sample of analyzed public safety documents include Continuity of Operations (COOP) plans, homeland security strategic documents, and after action reports (AARs). The COOP plans and the homeland security strategic documents helped inform several aspects of resilience, such as anticipating risk, understanding adverse events, recovery, and continuing operations. The AARs were evaluated to understand adaptive capacity, an attribute of the resilience management framework. Adaptive capacity refers to an organization’s culture and dynamics that allow for decision making in day-to-day operations and during times of crisis.<sup>109</sup> This helped to inform the aspects of organizational resilience absent from other documents, such as adaptability and absorbing lessons learned to mitigate vulnerabilities.

Few federal, state, or public safety agencies make their COOP plans publicly available. Therefore, for the purpose of this thesis, plans from Texas, Nebraska, and Virginia were chosen for analysis due to their availability.<sup>110</sup> Homeland security strategic documents were also available from the aforementioned states, and so were selected as well. There are limitations associated with using these publicly available documents. For example, these are a random or representative sample and therefore not entirely inclusive. However, such data problems are common and should not preclude

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<sup>107</sup> Ibid., 34.

<sup>108</sup> Ibid.

<sup>109</sup> McManus et al., *Facilitated Process*, 2.

<sup>110</sup> Texas Department of Public Safety, *Draft Continuity of Operations Agency Plan* (Austin, TX: Texas Division of Emergency Management, 2014); State of Texas, *Texas Homeland Security Strategic Plan 2010–2015* (Austin, TX: State of Texas, 2015); Nebraska Homeland Security Policy Group/Senior Advisory Council, *Nebraska State Homeland Security Strategy 2014–2016* (Lincoln, NE: Nebraska Emergency Management Agency, 2014); Nebraska Emergency Management Agency, *State of Nebraska Emergency Operations Plan* (Lincoln, NE: State of Nebraska, February 2014); Commonwealth of Virginia, *Emergency Operations Plan Continuity of Government and Operations Support Annex 1* (Richmond, VA: Commonwealth of Virginia, January 2010); Virginia Department of Emergency Management, *Strategic Plan 2012–2014 Version 1* (North Chesterfield, VA: Virginia Department of Emergency Management, 2012).

analysis.<sup>111</sup> While using publicly available documents proved challenging, it was not an insurmountable task; the sample documents are representative of plans from different parts of the country.

As with COOP plans, there are a limited number of publicly available AARs. Of the publicly available reports, the following were selected for analysis due to their variety across the characteristics of event type, scale, scope, and level of government: *Broome County American Civic Association Shooting April 3 2009 After Action Report and Improvement Plan*, *After Action Report for the Response to the 2013 Boston Marathon Bombings*, and *May 2014 San Diego County Wildfires After Action Report*.<sup>112</sup> The analysis focused on the presence—or absence—of resilience indicators articulated in the report and did not intend to analyze the response to the incident.

The reports reflect different incident types—active shooter, terrorism, and wildfire. One is law enforcement-centric while the other two are fire- or emergency management-focused. They also reflect small and large localities and incidents that were large in nature but mainly localized, and one which was a high-profile national event.

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<sup>111</sup> Patrick von Maravic, “Limits of Knowing or the Consequences of Difficult-Access Problems for Multi-Method Research and Public Policy,” *Policy Sciences* 45, no. 2 (2012): 153–168.

<sup>112</sup> Beck Disaster Recovery, *Broome County American Civic Association Shooting April 3, 2009 After-Action Report and Improvement Plan* (Binghamton, NY: Broome County, September 2009); Massachusetts Emergency Management Agency et al., *After Action Report for the Response to the 2013 Boston Marathon Bombings* (Boston: Commonwealth of Massachusetts, December 2014); San Diego Office of Emergency Management, *May 2014 San Diego County Wildfire After Action Report* (San Diego, CA: County of San Diego, June 2014).

#### D. ANALYSIS TOOL

For this thesis, the author converted the framework into the tools shown in Figures 4 and 5 in order to conduct the comparative content analysis on the sample documents.

		Texas		Virginia		Nebraska	
Resilience Indicator		COOP	Strategy	COOP	Strategy	EOP	Strategy
Situational Awareness	SA 1						
	SA 2						
	SA 3						
	SA 4						
	SA 5						
Resilience Indicator		COOP	Strategy	COOP	Strategy	EOP	Strategy
Keystone Vulnerabilities	KV 1						
	KV 2						
	KV 3						
	KV 4						
	KV 5						

Figure 4. Analysis Tool 1—Situational Awareness (SA) and Keystone Vulnerabilities (KV)

Resilience Indicator		AAR 1	AAR2	AAR3
Adaptive Capacity	AC 1			
	AC 2			
	AC 3			
	AC 4			
	AC 5			

Figure 5. Analysis Tool 2—Adaptive Capacity (AC)

In order to evaluate the resilience indicators with consistent language, the author modified the resilience management framework slightly. In the analysis tools, the *silo mentality* resilience indicator was changed from indicating the presence of silos to indicating the absence of silos.

## **(1) Analysis Process for Question 1**

*What can existing public safety doctrine contribute to understanding levels of organizational resilience in public safety agencies?*

The first comparative content analysis was completed on the publicly available COOP plans and homeland security strategic documents. Separate charts for situational awareness and management of keystone vulnerability attributes of resilience from the resilience management framework were completed for each document. This informed which aspects of the framework were present or not in each document and, if so, what specifically they included that helps inform an understanding of the agencies' resilience.

## **(2) Analysis Process for Question 2**

*How can existing public safety doctrine contribute to an understanding of the organizational resilience of public safety agencies?*

COOP and strategy documents tend to be forward-thinking documents and adaptive capacity is more response focused after an event; to better understand adaptive capacity, an additional chart was completed for this attribute utilizing AARs and the after action review process. Each of the resilience indicators for adaptive capacity were mapped to the AAR documents that discuss relevant ideas or approaches, thus illustrating how the reports contribute to the broader process of improving a public safety agency's adaptive capacity.

For each document, analysis elements included the absence of the silo mentality, communications and relationships, strategic vision and outcome expectancy, information and knowledge, and leadership management and governance structure indicators. It is important to reiterate that the analysis was conducted on the AAR itself, and the presence—or absence—of the resilience indicators articulated in the report; this thesis did not analyze the response to the incidents. For example, the analysis determined if the report was developed in a manner that was absent of silo mentality, but did not address if silo mentality was displayed during the response to the shooting, bombings, or wildfires. This was necessary in order to keep the analysis focused on existing doctrine and not operational public safety response activities.

## **E. LIMITATIONS AND IMPLICATIONS**

The analysis is based upon a small sample of documents, and only on publicly available documents. These documents do not necessarily represent all public safety agencies in all states. When dealing with public safety or national security agencies and problems, this sort of “availability bias” is not uncommon.<sup>113</sup> Additionally, because the agencies that publicly post their COOP plans may be somewhat different than those that do not (perhaps more transparent, perhaps proud of the work they have done, perhaps mandated by state law, etc.) they may also be the agencies or states that are more likely to embrace dialogue about these issues, and thus more open to work on improving their processes. Focusing on these states may, in fact, make sense—they may be more open to insights that can improve their already public continuity doctrine.

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<sup>113</sup> von Maravic, “Limits of knowing.”

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### **III. ANALYSIS PART ONE—SITUATIONAL AWARENESS AND MANAGEMENT OF KEYSTONE VULNERABILITIES RESILIENCE ATTRIBUTES**

To better appreciate what existing doctrine can contribute to our understanding of organizational resilience in public safety agencies, a comparative content analysis was conducted on doctrine from agencies in Texas, Virginia, and Nebraska. Specifically, this portion of the analysis focused on two of the three attributes of organizational resilience: situational awareness and management of keystone vulnerabilities.

The documents used for the analysis were:

- Texas Department of Public Safety, *Draft Continuity of Operations Agency Plan*, 2014
- State of Texas, *Texas Homeland Security Strategic Plan 2010–2015*
- Commonwealth of Virginia, *Emergency Operations Plan Continuity of Government and Operations Support Annex 1*, January 2010
- Virginia Department of Emergency Management, *Strategic Plan 2012–2014 Version 1*
- Nebraska Emergency Management Agency, *State of Nebraska Emergency Operations Plan*, February 2014
- Nebraska Homeland Security Policy Group/Senior Advisory Council, *Nebraska State Homeland Security Strategy 2014–2016*

The documents were analyzed to determine which resilience indicators from the “situational awareness” and “management of keystone vulnerabilities” attributes of the resilience management framework were present and which were not. Details regarding where the resilience indicators were discovered in each document can be found in Appendix A. As detailed in the research design, the situational awareness indicators are: roles and responsibilities, understanding hazards and consequences, connectivity awareness, insurance awareness, and recovery priorities.



## A. TEXAS

The Texas Department of Public Safety (DPS) has a mission to protect and serve Texas; its goals are to “combat crime and terrorism, enhance highway and public safety, enhance statewide emergency management, and enhance public safety licenses and regularly services.”<sup>114</sup> DHS funding in Texas is dispersed via the Texas Office of the Governor, and their mission promotes:

strategies to prevent terrorism and other catastrophic events and to prepare communities for the threats and hazards that pose the greatest risk to the security and resilience of Texas and the Nation.<sup>115</sup>

For this analysis, a draft COOP plan from DPS was reviewed as well as the *Homeland Security Strategic Plan 2010–2015* from the Texas Office of the Governor. DPS has publicly available strategic plans for multiple fiscal years posted on their website.<sup>116</sup> Their strategic plan is quite detailed, and thus it would be worthwhile to analyze in the context of the resilience management framework. That said, the strategic plan was outside the scope of this thesis and therefore purposefully excluded; comparable examples from other sample states were not available. The chart in Table 1—presented after the following subsections—depicts the results of both documents’ analyses.

### 1. Situational Awareness

This section addresses the five resilience indicators of the situational awareness attribute of resilience.

***Roles and Responsibilities:*** The DPS draft COOP plan did address incident roles and responsibilities, from the director level down to team members.<sup>117</sup> The State of Texas strategic plan, however, lacked detail on roles and responsibilities.

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<sup>114</sup> “DPS Vision, Mission, Goals, Values and Mottos,” Texas Department of Public Safety, accessed July 12, 2016, [https://www.txdps.state.tx.us/mission.htm?\\_sm\\_au\\_=iVVHQ64CBNkBVpMH](https://www.txdps.state.tx.us/mission.htm?_sm_au_=iVVHQ64CBNkBVpMH).

<sup>115</sup> “Homeland Security Grants Division,” State of Texas Office of the Governor, accessed July 12, 2016, [http://gov.texas.gov/hsgd?\\_sm\\_au\\_=iVVHQ64CBNkBVpMH](http://gov.texas.gov/hsgd?_sm_au_=iVVHQ64CBNkBVpMH).

<sup>116</sup> See, for example, Texas Department of Public Safety, *Agency Strategic Plan for Fiscal years 2013–2017* (Austin, TX: Texas Department of Public Safety), <https://www.txdps.state.tx.us/dpsStrategicPlan/2013-2017/DPSStrategicPlan2013-2017.pdf>

<sup>117</sup> Texas Department of Public Safety, *Draft Continuity of Operations Agency Plan*, 5–6.3.

***Understanding of Hazards and Consequences:*** The DPS draft COOP plan vaguely mentioned incidents and threats but did not go into detail, nor was the plan itself hazard specific.<sup>118</sup> The strategic plan included a comprehensive assessment of risk, defined by threats, vulnerabilities, and consequences.<sup>119</sup> It also detailed when and how such assessment is updated.<sup>120</sup>

***Connectivity Awareness:*** The draft COOP plan was specific to the DPS and did not mention external organizations. There was little articulated regarding awareness of impact on DPS staff. Unlike the strategic plan, this document highlighted a variety of external partners upon which the strategic plan is dependent to achieve success.<sup>121</sup>

***Insurance Awareness:*** There was no articulation of insurance awareness as part of either the draft COOP plan or the strategic plan.

***Recovery Priorities:*** Sections of the COOP plan were specifically dedicated to both recovery and reconstitution.<sup>122</sup> Goal 3 of the strategic plan was to “Minimize Damage through Rapid, Decisive Response and Quickly Recover”—with a variety of objectives related to capabilities necessary for recovery priorities.<sup>123</sup>

## **2. Management of Keystone Vulnerabilities**

This section addresses the five resilience indicators of the management of keystone vulnerabilities attribute of resilience.

***Planning Strategy:*** The planning strategy for the DPS draft COOP plan was clearly articulated.<sup>124</sup> Similarly, the strategic plan acknowledged a comprehensive planning strategy.<sup>125</sup>

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<sup>118</sup> Ibid., iv.

<sup>119</sup> State of Texas, *Texas Homeland Security Strategic Plan*, 8–9.

<sup>120</sup> Ibid.

<sup>121</sup> Ibid.

<sup>122</sup> Texas Department of Public Safety, *Draft Continuity of Operations Agency Plan*, 11–12.

<sup>123</sup> State of Texas, *Texas Homeland Security Strategic Plan*, 40.

<sup>124</sup> Texas Department of Public Safety, *Draft Continuity of Operations Agency Plan*, 4, 5, 18.

<sup>125</sup> State of Texas, *Texas Homeland Security Strategic Plan*, 5.

**Participation in Exercises:** In the planning strategy, DPS’s annual participation in training and exercises were clearly identified.<sup>126</sup> Additionally, participation in exercises was identified throughout the many goals and objectives contained within the strategic plan.<sup>127</sup>

**Capability and Capacity of Internal Resources:** The capability and capacity of internal resources resilience indicator was not present in either the draft COOP plan or the strategic plan.

**Capability and Capacity of External Resources:** The capability and capacity of external resources resilience indicator was not present in either the draft COOP plan or the strategic plan.

**Organizational Connectivity:** Organizational connectivity was not addressed in the draft COOP plan; however, the strategic plan acknowledged and was inclusive of a wide variety of stakeholders.<sup>128</sup>

Table 1. Completed Analysis Tool 1—Texas

TEXAS			
Resilience Indicator		COOP	Strategy
Situational Awareness	SA 1 - Roles and Responsibilities	X	
	SA 2 - Understanding of Hazards and Consequences		X
	SA 3 - Connectivity Awareness		X
	SA 4 - Insurance Awareness		
	SA 5 - Recovery Priorities	X	X
Resilience Indicator		COOP	Strategy
Keystone Vulnerabilities	KV 1 - Planning Strategies	X	X
	KV 2 - Participation in Exercises	X	X
	KV 3 - Capability and Capacity of Internal Resources		
	KV 4 - Capability and Capacity of External Resources		
	KV 5 - Organizational Connectivity		X

<sup>126</sup>Texas Department of Public Safety, *Draft Continuity of Operations Agency Plan*, 5, 18.

<sup>127</sup> State of Texas, *Texas Homeland Security Strategic Plan*.

<sup>128</sup> Ibid.

## B. VIRGINIA

The Commonwealth of Virginia’s Department of Emergency Management has a mission to “protect the lives and property of Virginia’s citizens and visitors from emergencies and disasters by coordinating the state’s emergency preparedness, mitigation, response and recovery efforts.”<sup>129</sup> This analysis reviewed the *Emergency Operations Plan Continuity of Government and Operations Support Annex 1* and *Strategic Plan 2012–2014 Version 1*. The chart in Table 2 depicts the results of both documents’ analyses.

### 1. Situational Awareness

This section addresses the five resilience indicators of the situational awareness attribute of resilience.

***Roles and Responsibilities:*** Throughout the Continuity of Government (COG) and Operations plan, roles and responsibilities were clearly articulated.<sup>130</sup> In the Strategic Plan, roles and responsibilities were not defined.

***Understanding Hazards and Consequences:*** While the understanding hazards and consequences resilience indicator was present in the COG plan, it is important to note that its inclusion was not comprehensive.<sup>131</sup> The Strategic Plan acknowledged that there are hazards and consequences, yet lacked further specificity. It is noteworthy that the Strategic Plan acknowledged that funding is available to its localities competitively based upon a threat- and risk-based formula, alluding that this indicator exists outside the scope of the analysis.<sup>132</sup>

***Connectivity Awareness:*** External government partners were detailed as a part of the statutory constitutional lines of succession in the COG plan.<sup>133</sup> This resilience indicator was not present in the Strategic Plan.

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<sup>129</sup> Commonwealth of Virginia, *Continuity of Government and Operations*, 1.

<sup>130</sup> *Ibid.*, 2, 3, 4, 6, 8.

<sup>131</sup> *Ibid.*, 2.

<sup>132</sup> *Ibid.*, 9.

<sup>133</sup> *Ibid.*, 3–6.

***Insurance Awareness:*** The insurance resilience indicator was not present in either the COG plan or the Strategic Plan.

***Recovery Priorities:*** In the COG plan, recovery priorities were identified.<sup>134</sup> In the Strategic Plan, recovery priorities were present as a standalone objective.<sup>135</sup>

## **2. Management of Keystone Vulnerabilities**

This section addresses the five resilience indicators of the management of keystone vulnerabilities attribute of resilience.

***Planning Strategies:*** The planning strategy was evident within the COG plan but not articulated in the Strategic Plan.<sup>136</sup>

***Participation in Exercises:*** Participation in exercises was made clear throughout the COG plan.<sup>137</sup> It was also listed in the Strategic Plan's goals and objectives.<sup>138</sup>

***Capability and Capacity of Internal Resources:*** The capability and capacity of internal resources resilience indicator was not present in either the COG plan or the Strategic Plan.

***Capability and Capacity of External Resources:*** The capability and capacity of external resources resilience indicator was not present in either the COG plan or the Strategic Plan.

***Organizational Connectivity:*** As with the *connectivity awareness* resilience indicator, organizational connectivity was addressed within the COG sections of the COG plan.<sup>139</sup> The Strategic Plan did not address this resilience indicator.

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<sup>134</sup> Ibid., 6–7. As with others, recovery priorities were mentioned but not detailed.

<sup>135</sup> Virginia Department of Emergency Management, *Strategic Plan*, 14–16.

<sup>136</sup> Commonwealth of Virginia, *Continuity of Government and Operations*, 2, 3, 4, 6, 8.

<sup>137</sup> Ibid.

<sup>138</sup> Virginia Department of Emergency Management, *Strategic Plan*.

<sup>139</sup> Commonwealth of Virginia, *Continuity of Government and Operations*, 3–6.

Table 2. Completed Analysis Tool 1—Virginia<sup>140</sup>

VIRGINIA			
Resilience Indicator		COOP	Strategy
Situational Awareness	SA 1 - Roles and Responsibilities	X	
	SA 2 - Understanding of Hazards and Consequences	X	
	SA 3 - Connectivity Awareness	X	X
	SA 4 - Insurance Awareness		
	SA 5 - Recovery Priorities	X	X
Resilience Indicator		COOP	Strategy
Keystone Vulnerabilities	KV 1 - Planning Strategies	X	
	KV 2 - Participation in Exercises	X	X
	KV 3 - Capability and Capacity of Internal Resources		
	KV 4 - Capability and Capacity of External Resources		
	KV 5 - Organizational Connectivity	X	X

### C. NEBRASKA

The Nebraska Emergency Management Agency, by state statute, is tasked to “reduce the vulnerabilities of the people and communities of Nebraska from the damage, injury and loss of life and property resulting from natural, technological or man-made disasters and emergencies.”<sup>141</sup> This analysis reviewed their state Emergency Operations Plan, a comprehensive plan that encompasses continuity. The Nebraska Homeland Security Policy Group/Senior Advisory Council is a multiple stakeholder advisory group that was responsible for developing the *Nebraska State Homeland Security Strategy 2014–2016*, which was the second document used for this analysis. The document’s creation was guided by the Nebraska Emergency Management Agency and the University of Nebraska Public Policy Center.<sup>142</sup> The chart in Table 3 depicts the results of both documents’ analyses.

<sup>140</sup> Appendix A provides detailed information regarding where the information was found in each of the Virginia documents.

<sup>141</sup> “About NEMA,” Nebraska Emergency Management Agency, accessed September 11, 2016, <https://nema.nebraska.gov/overview/about-nema>.

<sup>142</sup> Nebraska Homeland Security Policy Group, *Homeland Security Strategy*, 2.

## 1. Situational Awareness

This section addresses the five resilience indicators of the situational awareness attribute of resilience.

***Roles and Responsibilities:*** In the Emergency Operations Plan, organizational-level roles and responsibilities were clearly articulated and divided into “emergency support functions.”<sup>143</sup> The Homeland Security Strategy did not articulate roles and responsibilities.

***Understanding Hazards and Consequences:*** The Emergency Operations Plan clearly communicated the understanding of hazards and consequences; the detailed discussion further divided hazards into a wide variety of prioritized natural, technological, and security hazards.<sup>144</sup> The Homeland Security Strategy utilized Nebraska’s annual State and Regional THIRA for their understanding of the hazards and consequences facing their organization and their state.<sup>145</sup>

***Connectivity Awareness:*** Throughout the Emergency Operations Plan, a variety of independent partnering stakeholders were identified.<sup>146</sup> Throughout the Homeland Security Strategy, there is a similar articulation of the variety of stakeholders to which the Nebraska Emergency Management Agency is connected.<sup>147</sup>

***Insurance Awareness:*** The insurance awareness resilience indicator was not present in either the Emergency Operations Plan or the Homeland Security Strategy.

***Recovery Priorities:*** Both short- and long-term recovery priorities were described in the Emergency Operations Plan, for the Emergency Management Agency as well as other partners.<sup>148</sup> This resilience indicator was not present within the Homeland Security Strategy.

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<sup>143</sup> Nebraska Emergency Management Agency, *Emergency Operations Plan*, 100, 129, 149, 155, 161, 165, 251, 260, 274, 313, 324, 337, 352.

<sup>144</sup> *Ibid.*, 27.

<sup>145</sup> Nebraska Homeland Security Policy Group, *Homeland Security Strategy*, 7.

<sup>146</sup> Nebraska Emergency Management Agency, *Emergency Operations Plan*.

<sup>147</sup> Nebraska Homeland Security Policy Group, *Homeland Security Strategy*.

<sup>148</sup> Nebraska Emergency Management Agency, *Emergency Operations Plan*, 89.

## 2. Management of Keystone Vulnerabilities

This section addresses the five resilience indicators of the management of keystone vulnerabilities attribute of resilience.

*Planning Strategy:* The Emergency Operations Plan went into great detail about planning strategies.<sup>149</sup> Within the Homeland Security Strategy, the planning strategy was clearly communicated and included an inclusive planning process with a variety of mechanisms for participation from other stakeholders.<sup>150</sup> The document further referenced that other planning documents—such as the state Emergency Operations Plan, pandemic influenza plan, and local emergency operations plans—explain in greater detail how the goals in the strategy will be achieved.<sup>151</sup>

*Participation in Exercises:* The Emergency Operations Plan also went into great detail about participation in exercises for both its own department, and for its affiliate departments.<sup>152</sup> Participation in exercises, particularly hazard-specific exercises, was also present within the Homeland Security Strategy.<sup>153</sup>

*Capability and Capacity of Internal Resources:* The capability and capacity of internal resources resilience indicator was not present in either the Emergency Operations Plan or in the Homeland Security Strategy.

*Capability and Capacity of External Resources:* The capability and capacity of external resources resilience indicator was not present in either the Emergency Operations Plan or the Homeland Security Strategy.

*Organizational Connectivity:* Throughout the Emergency Operations Plan there was an appreciation of organizational connectivity, clearly identifying the other organizations and functions.<sup>154</sup> As evidenced by the inclusive group that developed the

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<sup>149</sup> Ibid.

<sup>150</sup> Nebraska Homeland Security Policy Group, *Homeland Security Strategy*, 2.

<sup>151</sup> Ibid.

<sup>152</sup> Nebraska Emergency Management Agency, *Emergency Operations Plan*.

<sup>153</sup> Nebraska Homeland Security Policy Group, *Homeland Security Strategy*, 9–10.

<sup>154</sup> Nebraska Emergency Management Agency, *Emergency Operations Plan*.



Homeland Security Strategy, there is an awareness of connectivity with other organizations, particularly within the public safety enterprise.<sup>155</sup>

Table 3. Completed Analysis Tool 1—Nebraska<sup>156</sup>

NEBRASKA				
		Resilience Indicator	COOP	Strategy
Situational Awareness		SA 1 - Roles and Responsibilities	X	
		SA 2 - Understanding of Hazards and Consequences	X	X
		SA 3 - Connectivity Awareness	X	X
		SA 4 - Insurance Awareness		
		SA 5 - Recovery Priorities	X	
		Resilience Indicator	COOP	Strategy
Keystone Vulnerabilities		KV 1 - Planning Strategies	X	X
		KV 2 - Participation in Exercises	X	X
		KV 3 - Capability and Capacity of Internal Resources		
		KV 4 - Capability and Capacity of External Resources		
		KV 5 - Organizational Connectivity	X	X

#### D. SYNTHESIS

The next phase of this analysis was to combine analysis tools for the Texas, Virginia, and Nebraska state documents in order to comprehensively review which resilience indicators were present and which were not. The chart in Table 4 shows the completed Comparative Content Analysis that allows for broader statements regarding how this analysis can contribute to the understanding the first research question: *How can existing public safety doctrine contribute to an understanding of the organizational resilience of public safety agencies?*

<sup>155</sup> Nebraska Homeland Security Policy Group, *Homeland Security Strategy*, 2–3.

<sup>156</sup> Appendix A provides detailed information regarding where the information was found in each of the Nebraska documents.

Table 4. Comparative Content Analysis—Analysis Tool 1<sup>157</sup>

		Texas		Virginia		Nebraska	
Resilience Indicator		COOP	Strategy	COOP	Strategy	EOP	Strategy
Situational Awareness	SA 1	X		X		X	
	SA 2		X	X		X	X
	SA 3		X	X	X	X	X
	SA 4						
	SA 5	X	X	X	X	X	
Resilience Indicator		COOP	Strategy	COOP	Strategy	EOP	Strategy
Keystone Vulnerabilities	KV 1	X	X	X		X	X
	KV 2	X	X	X	X	X	X
	KV 3						
	KV 4						
	KV 5		X	X	X	X	X

The situational awareness attribute of resilience had four of the five resilience indicators present within the COOP and homeland security strategic plans in all three cases. This suggests that these states are engaged in continuity- and strategic planning-related efforts that are contributing to a broader understanding of this attribute—situational awareness—of organizational resilience, in the context of the resilience management framework. Regardless of whether or not the indicator was present in the COOP or homeland security strategic plans, the important finding is that it is present within existing doctrine.

The situational awareness resilience indicators that were present within all of the analyzed COOP plans were *roles and responsibilities* and *recovery priorities*. The COOP plans in Virginia and Nebraska also had the *understanding hazards and consequences* and *connectivity awareness* resilience indicators present.

The situational awareness indicator that was present within all of the analyzed homeland security strategic documents was *connectivity awareness*. The homeland security strategic documents in Texas and Nebraska both contained the *understanding of*

<sup>157</sup> Appendix A provides detailed information regarding where the information was found in each of the documents.

*threats and hazards* resilience indicator and the documents in Texas and Virginia articulated the *recovery priorities* indicator. None of the homeland security strategic documents addressed the *roles and responsibilities* indicator, but these documents are strategic in nature—a high-level approach; therefore an absent *roles and responsibilities* indicator is not alarming.

**Insurance awareness is not communicated in existing doctrine.**

None of the COOP plans or homeland security strategic documents contained the *insurance awareness* resilience indicator. This finding is unsurprising, but important, for a few reasons. First, insurance assumes a form of risk transfer, and government agencies cannot always transfer risk—for example, in life safety situations. Second, as a McKinsey report titled *Strengthening Risk Management in the US Public Sector* found, risk management is more challenging for the public sector; there is a limited risk culture wherein organizations have a perception that the government can “bail out their program” should a risk event occur.<sup>158</sup>

Additionally, this was a state-level analysis. Some state agencies are self-insured and many states have standalone agencies that would be responsible for handling services such as insurance. That said, none of the analyzed plans articulated that such partners were included in the planning process. It would be beneficial to develop planning partnerships with the appropriate individuals or state agencies in order to gain a better awareness of how insurance and other risk transfer strategies can influence decision-making related to resilience.

**Capacity is not addressed in existing doctrine.**

None of the state’s COOP plans or homeland security strategic documents contained the *capability and capacity of internal resources* or the *capability and capacity of external resources* resilience indicators. It is important to note that, in this analysis, the only way this indicator would have been identified was if both *capability and capacity* were present. While the COOP plans and homeland security strategic plans did address

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<sup>158</sup> Stephan Braig, Biniam Gebre, and Andrew Sellgren, *Strengthening Risk Management in the US Public Sector* (New York: McKinsey & Company, 2011), 3–4.

capability (the ability to perform the task) for both internal and external resources, no plans addressed capacity (how long and to what depth the task could be performed).

Two specific components of resources to which the resilience management framework calls attention—human resources and process resources (economic and administrative resources)—are particularly challenging for public safety agencies. A large-scale incident can last for a prolonged period of time. There are a variety of mechanisms in place that augment capacity during these crisis situations—such as the Emergency Management Assistance Compact and the Federal Disaster Declaration process. It would behoove organizations, particularly in the public safety realm, to address capacity issues more deeply in their planning and preparedness efforts, whether the solution is internal or external, in order to better understand their resilience.

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#### **IV. ANALYSIS PART TWO—ADAPTIVE CAPACITY RESILIENCE ATTRIBUTES**

To better appreciate what existing public safety doctrine can contribute to our understanding of organizational resilience in public safety agencies, a comparative content analysis was conducted on AARs from such agencies in Broome County, New York; San Diego County, California, and Boston, Massachusetts. Specifically, this portion of the analysis focused on the third attribute of organizational resilience: adaptive capacity. The documents used for the analysis were:

- *American Civic Center Association Shooting April 3, 2009 After-Action Report & Improvement Plan*
- *After Action Report for the Response to the 2013 Boston Marathon Bombings*
- *May 2014 San Diego County Wildfire After Action Report*

The documents were analyzed to determine which resilience indicators from the adaptive capacity attribute of the resilience management framework were present and which were not. It is important to note that the analysis was conducted on the AAR document, and not the response to the incident itself. The term *adaptive* reflects a change in response to a change in the environment. All of the incidents in this section are indicative of changes in the environment, and as such the public safety organizations had to adapt. Details regarding where the resilience indicators were found in each document can be found in Appendix B.

As discussed in Chapter II, adaptive capacity focuses on both the culture and dynamics that allow organizations to make timely and actionable decisions both in times of crisis and in a day-to-day manner.<sup>159</sup> The adaptive capacity attribute is divided into the following resilience indicators: silo mentality; communications and relationships; strategic vision of outcome expectancy; information and knowledge; and leadership, management, and governance structure.<sup>160</sup>

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<sup>159</sup> McManus et al., *Resilience Management*, 2.

<sup>160</sup> *Ibid.*, iii.

For the purpose of the analysis, and to maintain consistency with the resilience indicators, the resilience management framework was modified slightly. In the Analysis Tool, the *silo mentality* resilience indicator was changed from indicating the presence of silos to indicating the absence of silos; the silo mentality indicator refers to the absence of silo mentality, and if the AAR shows a centralized and collaborative approach to achieving goals with a broad strategic understanding and of the organization's overall vision.

Further, because these reports reflect incidents that actually occurred and discuss evidence in practice, rather than the more strategic-level planning doctrine that was analyzed in the situational awareness and management of keystone vulnerabilities attributes, each section begins with a brief overview of the incident to put the analysis of the resilience management framework in context. It is important to note that the analysis conducted was on the information contained within the AAR and did not examine the actions taken during the incident.

#### **A. AMERICAN CIVIC ASSOCIATION SHOOTING AFTER-ACTION REPORT & IMPROVEMENT PLAN**

Around 10:30 a.m. on April 3, 2009, a lone gunman, Jiverly Wong, entered the American Civic Association (ACA) in Binghamton, New York. He immediately shot two female receptionists, one fatally. He continued to the nearest classroom, where an English as a second language (ESL) class was being conducted, and fatally shot twelve people and then committed suicide. In its entirety, from the shooter entering the building until his suicide, the incident lasted three minutes.<sup>161</sup> At the time, it was the deadliest mass shooting in the United States since the Virginia Tech shooting in April 2007.<sup>162</sup>

The first calls to the Broome County 911 Center were made at 10:30 a.m.<sup>163</sup> Binghamton Police Department arrived at the scene at 10:33 a.m. with a Binghamton Fire Ambulance and Superior Ambulance Service (a private ambulance company) arriving

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<sup>161</sup> Beck Disaster Recovery, *American Civic Association Shooting After-Action Report*, 4.

<sup>162</sup> Robert D. McFadden, "13 Shot Dead during a Class on Citizenship," *New York Times*, April 3, 2009, [http://www.nytimes.com/2009/04/04/nyregion/04hostage.html?\\_r=0](http://www.nytimes.com/2009/04/04/nyregion/04hostage.html?_r=0).

<sup>163</sup> Beck Disaster Recovery, *American Civic Association Shooting After-Action Report*, 4.

shortly after and staged emergency medical services (EMS) nearby.<sup>164</sup> SWAT team assistance was requested by the police department at 10:37 a.m. and entered the building at 11:13.<sup>165</sup> The first ten survivors were escorted from the building at 12:00 p.m. and ten more at 12:40 p.m., and the remaining survivors were hiding in the basement boiler room for an additional three hours until the building was cleared by the SWAT team.<sup>166</sup>

Wong had previously attended classes at the ACA—an organization that provides ESL classes and services to immigrants who recently arrived in the United States.<sup>167</sup> In a letter, Wong blamed his action on what he believed was police harassment due to his poor English speaking skills.<sup>168</sup> The event resulted in the City of Binghamton, a small city of 43,000 located in Broome County, about 175 miles from New York City, being thrust into national and international news.<sup>169</sup>

The Office of Emergency Services (OES) in Broome County, New York’s mission statement is:

To provide planning, training, resources, response, warning, coordination and information through communications to the public, elected officials and public safety agencies to assist them in preparing for, responding to and mitigating emergencies and disasters which affect the residents of Broome County.<sup>170</sup>

Following the ACA shooting, the OES coordinated the effort, alongside contractor Beck Disaster Recovery, to complete the *American Civic Association Shooting After-Action Report & Improvement Plan*. That report is the basis for this analysis, the results of which are summarized in Table 5, after the following subsections.

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<sup>164</sup> Ibid.

<sup>165</sup> Ibid.

<sup>166</sup> Ibid.

<sup>167</sup> Ibid.

<sup>168</sup> Ibid., 5.

<sup>169</sup> McFadden, “13 Shot Dead.”

<sup>170</sup> “Emergency Services,” Broome County, accessed August 8, 2016, <http://www.gbroomecounty.com/e911>.



**(1) Absence of Silo Mentality and Communication and Relationships**

As the *silo mentality* and *communication and relationships* indicators are interdependent, these indicators were analyzed together. The report articulates a lack of silo mentality; the report’s development was centrally managed and highlighted strong and effective communication and relationships, with a broad multi-disciplinary and multi-jurisdictional set of stakeholders involved in the after action review process. This was highlighted in a list of 24 participants across different disciplines and levels of government, listed in Table 5.

Table 5. Stakeholders in After-Action Report & Improvement Plan<sup>171</sup>

Director of Community Relations	City of Binghamton
Commissioner of Social Services and Mental Health	Broome County
County Executive	Broome County
Emergency Preparedness Coordinator	Broome County OES and Health
OES Director and Fire Coordinators	Broome County OES
Supervising Public Health Educator	Broome County DOH
Fire Chief	Broome County DOH
Deputy County Executive	Broome County
Sheriff	Broome County Sheriff’s Office
Undersheriff	Broome County Sheriff’s Office
Detective Sergeant/Deputy Fire Coordinator	Broome County Sheriff’s Office/OES
Senior Fire Investigator	Broome County OES
Chief of Police	City of Binghamton Police Department
Deputy Commissioner for Mental Health	Broome County Mental Health
Executive Assistant to the County Executive	Broome County
Mayor	City of Binghamton
Communication Supervisor	Broome County 911
Deputy County Executive	Broome County
Executive Director	Crime Victim Assistance Center
EMS Coordinator	Broome County OES
Director, Emergency Services	American Red Cross
Regional Coordinator	NYS Emergency Management
Chief Deputy Fire Coordinator	Broome County OES
Planning Section Chief	NYS Emergency Management

<sup>171</sup> Beck Disaster Recovery, *American Civic Association Shooting After-Action Report*, 32–34.

Additionally, the report articulated that there were several identified areas for improvement that fell outside of the county’s jurisdictional boundaries but that would be addressed by a regional working group structure.<sup>172</sup> Finally, many of the recommendations involved multiple responsive organizations.<sup>173</sup>

## **(2) Strategic Vision and Outcome Expectancy**

The After-Action Report & Improvement Plan articulated a strategic vision of an outcome as well as a defined purpose. This is evidenced by the statement that “Broome County OES strives to be a national model of best practices in emergency planning, preparation, response and recovery.”<sup>174</sup> They indicate that the After-Action Review & Improvement Plan was designed to be a roadmap that is “applicable to all City and County organizations that are involved in a broad array of emergency response and recovery activities.”<sup>175</sup> Additionally, the report lists high-level objectives for achieving its overall goal of improvement.<sup>176</sup> These include:

- To understand and review the processes and procedures undertaken by Broome County OES and the City of Binghamton in post-event deployments and to provide a comprehensive report and process improvement plan that will highlight both key strengths and areas for improvement.
- The evaluation of activities, processes and procedures is a fundamental link to improvement planning because it assesses performance in a real-world event and identifies strengths and areas for improvement. The evaluation process identifies improvement opportunities and improvement planning provides a disciplined process for implementing corrective actions.
- Utilizing standard evaluation methodology, [Beck Disaster Recovery] employed an analytical process to assess the demonstration of capabilities during the response and recovery of the ACA Shooting.<sup>177</sup>

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<sup>172</sup> Ibid., 21.

<sup>173</sup> Ibid., 24–31.

<sup>174</sup> Ibid., 4.

<sup>175</sup> Ibid.

<sup>176</sup> Ibid., 5.

<sup>177</sup> Ibid., 5–6.

### (3) Information and Knowledge

In order to complete the After-Action Report & Improvement Plan, there was a dedicated way that information was shared—both the nature of the information and its format. A secure Microsoft SharePoint site was established and served as the centralized repository for sharing and receiving information throughout the review process.<sup>178</sup> Broome County OES recognized that active participation from all relevant stakeholders was critical to the success of the review; as a result, the SharePoint site ensured that the observations included in the report were reflective of all stakeholders and that all stakeholders had access to the right information at the right time.<sup>179</sup>

### (4) Leadership, Management, and Governance Structure

Lastly, throughout the development of the After-Action Review & Improvement Plan, strong leadership, management, and a clear governance structure was present. For example, during meetings, leadership from all participating agencies were present, and each area of improvement was identified through consensus.<sup>180</sup>

Table 6. Completed Analysis Tool 2—Broome County<sup>181</sup>

Resilience Indicator		ACA AAR
Adaptive Capacity	AC 1 - Absence of Silo Mentality	X
	AC 2 - Communication and Relationships	X
	AC 3 - Strategic Vision and Outcome Expectancy	X
	AC 4 - Information and Knowledge	X
	AC 5 - Leadership, Management, and Governance Structure	X

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<sup>178</sup> Ibid., 13–14.

<sup>179</sup> Ibid., 13.

<sup>180</sup> Ibid., 15.

<sup>181</sup> Appendix B provides a detailed description regarding where each indicator was found within the document.

## **B. 2013 BOSTON MARATHON BOMBING AFTER ACTION REPORT**

On April 15, 2013, the City of Boston hosted the 117th Boston Marathon—an event with 27,000 runners, held on Patriot’s Day.<sup>182</sup> Two improvised explosive devices (IEDs) were detonated in the viewing area of the marathon’s finish line.<sup>183</sup> Three individuals were killed, 264 spectators were injured and sixteen survivors suffered traumatic amputations.<sup>184</sup> The bombings resulted in a multi-day manhunt and an unprecedented “shelter-in-place” within the city.<sup>185</sup>

On April 17, 2013, President Obama issued an emergency declaration.<sup>186</sup> The following day, the Federal Bureau of Investigation (FBI) held a press conference during which they released photographs of two suspects, cautioned that the suspects “may be heavily armed and should be considered extremely dangerous,” and asked for the public’s assistance to identify the suspects and their whereabouts.<sup>187</sup>

The same evening, Massachusetts Institute to Technology (MIT) Police Officer Sean Collier was fatally shot in his marked patrol vehicle while on the MIT campus in Cambridge, Massachusetts.<sup>188</sup> Shortly thereafter a sports utility vehicle was carjacked and the vehicle’s owner was held against his will for almost an hour as the two suspects drove around Boston’s Allston neighborhood.<sup>189</sup> The suspects stopped the vehicle at a gas station where the victim was able to flee and call 911. Police were able to locate the vehicle via the anti-theft GPS system.<sup>190</sup>

A Watertown Police officer responded to the scene, quickly identifying the vehicle, and a firefight ensued. Additional officers arrived from a variety of police

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<sup>182</sup> Massachusetts Emergency Management Agency et al., *Boston Marathon Bombings*, 15.

<sup>183</sup> *Ibid.*, 4.

<sup>184</sup> *Ibid.*

<sup>185</sup> *Ibid.*

<sup>186</sup> *Ibid.*, 5.

<sup>187</sup> *Ibid.*

<sup>188</sup> *Ibid.*

<sup>189</sup> *Ibid.*, 6.

<sup>190</sup> *Ibid.*

departments, including Watertown, Boston, Cambridge, and Transit Police Departments, and the Massachusetts State Police.<sup>191</sup> During the firefight, one suspect was wounded. The second suspect fled the scene in the stolen SUV and, while fleeing, struck the first suspect with his vehicle, compounding his injuries.<sup>192</sup> A Transit Police officer was critically wounded and the first suspect was transported to a hospital where attempts to resuscitate him were unsuccessful. Law enforcement identified the first suspect as Tamerlan Tsarnaev through his fingerprints, and determined that his brother, Dzhokhar Tsarnaev, was the second suspect.<sup>193</sup> Law enforcement located the abandoned vehicle not far from the firefight, indicating that Dzhokhar Tsarnaev had fled on foot.<sup>194</sup>

A Unified Command was positioned in the Watertown area to manage strategic decision-making, and the shelter-in-place request and notification was made through an emergency notification system. The shelter-in-place request had cascading effects in the city, particularly on area hospitals.<sup>195</sup>

Law enforcement officials became increasingly concerned that Dzhokhar Tsarnaev had fled the area and, because of the burden the shelter-in-place request put on the area, the governor of Massachusetts held a press conference to lift the request; he cautioned Boston residents to remain vigilant and encouraged suspicious activity reporting.<sup>196</sup> Less than an hour later, Watertown Police received a 911 call reporting a sighting of the suspect in a boat parked in his yard.<sup>197</sup> More than 100 officers self-deployed to the scene. An officer, without jurisdictional authority, thought he saw movement in the boat and fired his weapon. Other officers near the scene heard the initial shot and thought it had been fired from the boat, causing them to open fire on the boat.<sup>198</sup> Using infrared cameras, law enforcement was able to confirm that Dzhokhar Tsarnaev

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<sup>191</sup> Ibid.

<sup>192</sup> Ibid.

<sup>193</sup> Ibid.

<sup>194</sup> Ibid.

<sup>195</sup> Ibid., 7.

<sup>196</sup> Ibid., 8.

<sup>197</sup> Ibid.

<sup>198</sup> Ibid.

was still alive.<sup>199</sup> After an almost two-hour standoff, Dzhokhar Tsarnaev emerged from the boat where he was arrested and transported to the hospital. Law enforcement then announced his capture.<sup>200</sup> A ceremony during which the FBI returned control of Boyston Street to the City of Boston was held on April 22, 2013. Two days later, Boylston Street was reopened to the public.<sup>201</sup>

In December 2014, the *After Action Report for the Response to the 2013 Boston Marathon Bombings* was released by the report's project team, which comprised representatives from the City of Boston, City of Cambridge, Town of Watertown, Massachusetts Bay Transportation Authority Transit Police Department, Massachusetts Department of Public Health, the Massachusetts Emergency Management Agency, Massachusetts National Guard, and the Massachusetts State Police.<sup>202</sup> That report is the basis for this analysis, the results of which are summarized in Table 7. As the *sil mentality* and *communication and relationships* indicators are interdependent, these indicators were analyzed together.

### **(1) Absence of Silo Mentality and Communication and Relationships**

The review was coordinated with key organizations involved in the response and included an inclusive multi-disciplined and multi-jurisdiction management team.<sup>203</sup> This team was supported by a third party, a private sector vendor.<sup>204</sup> Additionally, the report states:

It is important to note that public safety, public health, EMS, and healthcare partners have been working collaboratively since the day of the bombings to address areas needing improvement, and many corrective action measures were implemented prior to the 2014 Boston Marathon.<sup>205</sup>

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<sup>199</sup> Ibid.

<sup>200</sup> Ibid.

<sup>201</sup> Ibid.

<sup>202</sup> Ibid., 12.

<sup>203</sup> Ibid., 3.

<sup>204</sup> Ibid.

<sup>205</sup> Ibid., 9.

## **(2) Strategic Vision and Outcome Expectancy**

The purpose for the report and its articulated outcome was to identify best practices, lessons learned, recommendations for public safety and health organizations and medical personal, and to ensure corrective measures needing improvement were identified.<sup>206</sup> Additionally, the project team hoped that the best practices and lessons learned through the review process would provide insight and assistance for other organizations and jurisdictions throughout the nation preparing for future events.<sup>207</sup>

## **(3) Information and Knowledge**

While the report indicates that TriData—the private sector vendor that compiled the report—interviewed more than 150 individuals, there is no other indication of the information and knowledge indicators.<sup>208</sup> While findings were gleaned from the interview process, no other information on the nature or format of information sharing was articulated.

## **(4) Leadership, Management, and Governance Structure**

Senior leadership from the Massachusetts Emergency Management Agency, Massachusetts State Police, Massachusetts Bay Transportation Authority Transit Police Department, Massachusetts Department of Public Health, Massachusetts National Guard, City of Boston Mayor’s Office of Emergency Management, Cambridge Police Department, and Watertown Police Department were engaged in the review process.<sup>209</sup>

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<sup>206</sup> Ibid., 3.

<sup>207</sup> Ibid., 3.

<sup>208</sup> Ibid., 16–17.

<sup>209</sup> Ibid., 17.

Table 7. Completed Analysis Tool 2—Boston<sup>210</sup>

Resilience Indicator		Boston AAR
Adaptive Capacity	AC 1 - Absence of Silo Mentality	X
	AC 2 - Communication and Relationships	X
	AC 3 - Strategic Vision and Outcome Expectancy	X
	AC 4 - Information and Knowledge	
	AC 5 - Leadership, Management, and Governance Structure	X

### C. MAY 2014 SAN DIEGO WILDFIRES AFTER ACTION REPORT

On May 13, 2014, the San Diego wildfires started around 11:00 a.m. with the Bernardo Fire.<sup>211</sup> Over the next several days, fourteen additional fires were documented—the largest were the Bernardo, Poinsettia, and Cocos Fires, impacting the most residents, the largest geographic areas, and causing the most damage and destruction.<sup>212</sup> The last fire was fully contained on May 22, 2014.<sup>213</sup>

The county’s Operational Area Emergency Operation’s Center (OA EOC) was activated by the County of San Diego’s Office of Emergency Services at a level 1 (the lowest level) when the first wildfire began on May 13.<sup>214</sup> As additional wildfires ignited, the OA EOC activation was elevated to a level 3 (its highest level) on May 14, and remained activated at that level until May 18. Also on May 14, a “Proclamation of Local Emergency” was issued by the County of San Diego and the governor proclaimed a state of emergency in San Diego, at the county’s request.<sup>215</sup>

In total, the May 2014 wildfires involved fourteen fires over 26,000 acres with over 149,000 evacuation orders and warnings through the emergency mass notification

<sup>210</sup> Appendix B provides a detailed description regarding where each indicator was found within the document.

<sup>211</sup> San Diego Office of Emergency Management, *Wildfire After Action Report*, 9.

<sup>212</sup> *Ibid.*

<sup>213</sup> *Ibid.*

<sup>214</sup> *Ibid.*

<sup>215</sup> *Ibid.*, 10.



systems; 121,000 people were evacuated, five emergency shelters opened, and numerous school districts were closed.<sup>216</sup> On May 18, 2014, all evacuation orders were lifted.<sup>217</sup>

The Office of Emergency Services (OES) in San Diego has the responsibility to:

Coordinate the overall county response to disasters. OES is responsible for alerting and notifying appropriate agencies when disaster strikes; coordinating all agencies that respond; ensuring resources are available and mobilized in times of disaster; developing plans and procedures for response to and recovery from disasters; and developing and providing preparedness materials for the public.<sup>218</sup>

Following the series of wildfires in May 2014, the County of San Diego conducted a review and published the Wildfire After Action Report. This report is the basis for this analysis, the results of which are summarized in Table 8.

#### **(1) Absence of Silo Mentality and Communication and Relationships**

The *silo mentality* and *communication and relationships* indicators were absent due to the report's scope. The report focused on the regional response but did not include all response agencies, indicating that "cities and responding agencies will conduct their own after action planning process."<sup>219</sup> Some of the recommendations contained within the report outline organizations that are responsible for implementation; however, they are only for county-level agencies and are not multi-jurisdictional.<sup>220</sup> Further, the report indicated that it "does not specifically address the response of fire agencies and law enforcement."<sup>221</sup> Thus this report did appear to have a somewhat silo-ed mentality.

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<sup>216</sup> Ibid., 11.

<sup>217</sup> Ibid., 12.

<sup>218</sup> "Office of Emergency Services," County of San Diego, accessed September 11, 2016, <http://www.sandiegocounty.gov/oes/>.

<sup>219</sup> San Diego Office of Emergency Management, *Wildfire After Action Report*, 3.

<sup>220</sup> Ibid., 70–76.

<sup>221</sup> Ibid., 8.

## (2) Strategic Vision and Outcome Expectancy

The strategic vision and outcome expectancy of the review process was clearly articulated by the report’s authors:

This report is intended to serve as an asset to further enhance San Diego County’s ability to respond effectively to and minimize life and property loss from disasters, particularly in the face of what appears to be a severe fire season. The intent of this After Action Report is to document the County of San Diego’s response efforts during the May 2014 San Diego County Wildfires beginning on May 13, 2014.<sup>222</sup>

## (3) Information and Knowledge

The *information and knowledge* indicator was not present within the 109-page document. The nature and format of information sharing that occurred throughout the review process and the report development was not articulated at all.

## (4) Leadership, Management, and Governance Structure

However limited in scope, the *leadership, management, and governance structure* indicator was present at the county level. The review process and report development was done at the direction of the Board of Supervisors in San Diego and the county’s Chief Administrative Office charged OES with “reviewing the county’s preparations for, immediate response to, and initial recovery efforts from the May 2014 fires.”<sup>223</sup>

Table 8. Completed Analysis Tool 2—San Diego County<sup>224</sup>

Resilience Indicator		Wildfire AAR
Adaptive Capacity	AC 1 - Absence of Silo Mentality	
	AC 2 - Communication and Relationships	
	AC 3 - Strategic Vision and Outcome Expectancy	X
	AC 4 - Information and Knowledge	
	AC 5 - Leadership, Management, and Governance Structure	X

<sup>222</sup> Ibid.

<sup>223</sup> Ibid.

<sup>224</sup> Appendix B provides a detailed description regarding where each indicator was found within the document.

**D. SYNTEHSIS**

The synthesized Comparative Content Analysis for the three AARs is summarized in Table 9.

Table 9. Comparative Content Analysis—Analysis Tool 2

Resilience Indicator		ACA AAR	Boston AAR	Wildfire AAR
Adaptive Capacity	AC 1 - Absence of Silo Mentality	X	X	
	AC 2 - Communication and Relationships	X	X	
	AC 3 - Strategic Vision and Outcome Expectancy	X	X	X
	AC 4 - Information and Knowledge	X		
	AC 5 - Leadership, Management, and Governance Structure	X	X	X

**(1) There is more variation among indicators found in after action reports.**

It is worth noting that this analysis was done with documents at different levels: a small city versus two large cities; large but mainly localized events versus a national event; law enforcement response versus fire and emergency management response, etc. That said, the content contained within each of the AARs and the accompanying review processes varied greatly.

It is interesting that the two AARs developed with contractor support, the ACA shooting and the Boston Marathon Bombings reports, contained more resilience indicators of adaptive capacity than the one written by the county. While the sample size is small, making it impossible to draw broad conclusions, it would be interesting to see if the presence of a third or outside party, such as a contractor, results in a more comprehensive AAR with a larger document sample.

**(2) Organizations with strong leadership and strategic vision may be more likely to develop after action reports.**

The framework's creators argue that the *leadership, management, and governance structure* indicator (AC5) is “one of the most important features for adaptive capacity and overall resilience.”<sup>225</sup> This analysis concurs with their claim. AC5 was present within all cases. Because high-level support is necessary to develop and publish an AAR, it is not surprising that this indicator is present. As the ACA shooting AAR stated, “this clearly demonstrates the proactive approach being taken by senior leadership to ensure that lessons learned from this tragic event are institutionalized and carried forward.”<sup>226</sup>

In the book *The Politics of Crisis Management: Public Leadership under Pressure*, the authors suggest that one way leaders learn from a crisis is assessment after the fact, including the after action review process.<sup>227</sup> They also indicate that good leaders learn from a wide variety of crises and learn lessons from the impact of the crisis.<sup>228</sup>

The presence of the *leadership, management, and governance structure* indicator encourages the inclusion of the *strategic vision and outcome expectancy* resilience indicator, which was also present in all documents analyzed. All of the AARs articulated the desire to understand best practices and lessons learned, to enhance their ability to carry out important missions—protecting and responding to crises within their communities, and providing insight to others. It is worth noting that the sample of AAR documents, and really any sample of AAR documents, may be biased by the fact that leadership buy-in is likely an important part of the AAR being successfully conducted in the first place, and even more likely an important part of those documents becoming public.

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<sup>225</sup> McManus et al., *Resilience Management*, 34.

<sup>226</sup> Beck Disaster Recovery, *American Civic Association Shooting After-Action Report*, 1.

<sup>227</sup> Arjen Boin, Paul 't Hart, Eric Stern, and Bengt Sundelius, *The Politics of Crisis Management: Public Leadership under Pressure* (Cambridge: Cambridge University Press, 2005), 6.

<sup>228</sup> *Ibid.*, 125.

**(3) Publicly available after action reports contribute to understanding organizational resilience.**

AARs are frequently conducted for a variety of incidents and exercises, but few are publicly released. The fact that the agencies released these documents highlights all of the resilience indicators of adaptive capacity. The lessons learned from these events are worthwhile for all public safety agencies. There is both an absence of silo mentality and a kind of communication and information sharing that occurs as a result of their public release that could potentially improve broader resilience by allowing organizations to learn from each other. The release can potentially help organizations that develop AARs achieve their strategic visions and outcome expectancy—if part of the outcome they are looking for is increased partner capability or increased public support and understanding. Finally, the release of these documents highlights strong leadership and management by suggesting that those running these organizations are open to self-criticism and want to improve their performance.

## V. FINDINGS AND AREAS FOR FURTHER STUDY

There are several relevant findings based on the available sample documents and the conducted analysis. For example, existing documents can contribute to our understanding of organizational resilience among public safety agencies, and after action reports and their resultant learning process contribute to understanding adaptive capacity. The analysis also allowed for identification of worthy areas for further study.

### A. FINDINGS

#### (1) **Public safety agencies are engaged in efforts that contribute to understanding their organizational resilience.**

There is little literature on resilience at the organizational level and even less regarding organizational resilience in public safety agencies. If a resilient homeland security enterprise is the goal, then it cannot be accomplished without resilience among the various components of that enterprise, particularly public safety agencies. As this thesis found, frameworks have been developed that have applicability to understanding organizational resilience. Moreover, public safety agencies are engaging in a variety of activities—COOP plans, homeland security strategic plans, and AARs—that contribute to understanding organizational resilience within their agencies.

There is no need to start understanding resilience in public safety agencies from scratch. It is worthwhile to build upon existing frameworks and doctrine rather than to create a new process that will likely duplicate current efforts.

#### (2) **New Zealand’s approach to resilience management is a worthwhile framework for public safety agencies in the United States.**

The creators of the resilience management framework argue that building more resilient organizations is “complicated by an inability to translate the concept of resilience into tangible working constructs.”<sup>229</sup> Their framework provides that working construct.

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<sup>229</sup> Ibid., 81.

As evidenced in the analysis of the three attributes of resilience, these are relevant indicators, most of which public safety are addressing in existing doctrine. The indicators not present were the *insurance awareness* indicator of the situational awareness attribute and the *capability and capacity of internal and external resources* indicators of the management of keystone vulnerabilities attribute.

As further found in the analysis, it would be beneficial for public safety agencies to gain insurance awareness by broadening planning partnerships to address this issue—that is, if it is not found in existing doctrine that was not examined within the scope of this thesis. This thesis also found that capacity was not present within the doctrine but that it should be. This could be accomplished with slight modifications to existing COOP plans and homeland security strategic documents.

During the analysis for the adaptive capacity resilience attribute, there was overlap between the indicators; *silo mentality* and *communications and relationships* were analyzed together to avoid confusion and duplication. If there is an absence of silo mentality, there was strong communication and relationships. Either both were present or both were not.

Also similar were the *leadership, management, and governance structure* and *strategic vision outcome expectancy* resilience indicators. The analysis was conducted considering these as standalone indicators—however, if there is leadership, management, and governance, then there was also a strategic vision and outcome expectancy. One could argue that strategic vision and outcome expectancy can be present without the leadership, management, and governance structure; however, that was not the case with the selected AARs. Perhaps this particular attribute of resilience, adaptive capacity, can be condensed into either three or four resilience indicators rather than five.

**(3) After action reports should be standardized and federal guidance would support such standardization.**

As the analysis of the AARs found, there is more variation in the information contained within the AARs than within the COOP plans and homeland security strategic documents. This finding matches existing arguments regarding the lack of standardization in the AAR process. As research suggests, if there were standardization in such reports, they would have greater utility as a data source.<sup>230</sup> This analysis concurs with that statement.

The literature review also showed that both COOP plans and homeland security strategies have dedicated federal guidance and doctrine to guide state and local efforts. Perhaps there should be federal guidance regarding the process of conducting AARs and a standardized template for completing them. It would be beneficial for both academic research on the topic and for public safety agencies that are trying to incorporate lessons learned from past events into their organizations. Further, more standardized reports, and encouragement to make AARs publicly available, may contribute to a decrease in the commonly identified failures from previous AARs.

While some would argue that FEMA encourages the development of AARs, any guiding doctrine focuses on exercises, such as the Homeland Security Exercises and Evaluation Program, rather than actual events.<sup>231</sup> This thesis suggests that is not sufficient guidance, or that it is specific to actual incidents rather than exercises. Different states had different approaches to completing AARs. Examples from the analysis found two used contractors while one did not, and one looked at just the county level while the others were more inclusive of broader response stakeholders involved in the incident.

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<sup>230</sup> Faith, Jackson, and Willis, “Text Analysis of After Action Reports.”

<sup>231</sup> “Homeland Security Exercise and Evaluation Program,” Federal Emergency Management Agency, accessed August 29, 2016, <https://www.fema.gov/media-library/assets/documents/32326>.



## **B. AREAS FOR FURTHER STUDY**

- (1) While much work has been completed to help understand organizational resilience in public safety agencies, we can do more to provide a more comprehensive understanding of resilience.**

One of the findings of this thesis is that New Zealand's approach to resilience management is a worthwhile framework for public safety agencies in the United States; there is utility to applying this methodology to a broader set of documents. That would allow for an analysis of additional existing doctrine, but can also challenge the assertions in this thesis and validate or disprove its findings.

A logical next step would be to follow the ResOrgs approach, the "Facilitated Process for Improving Organizational Resilience." This in-person process could reach a wider scope of documentation and provide insight into other activities public safety agencies are engaged in that contribute to their understanding of their organizational resilience.

The ResOrgs authors highlighted success with this approach. Post-study discussions the researchers had with "key decision makers" in the eight organizations that fully participated saw value in the resilience management process, adopted recommendations made throughout the process, and engaged in additional resilience management activities outside of the study.<sup>232</sup> Researchers found "the use of specific planning, such as risk management and business continuity planning, together with the ability to link these plans and test them using exercises, are also significant indicators of resilience."<sup>233</sup> The "Facilitated Process" may be worthwhile to study further, exploring whether or not this would be applicable to public safety agencies in the United States, and may be able to provide insight to a wider scope of relevant doctrine.

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<sup>232</sup> McManus et al., "Facilitated Process," 87.

<sup>233</sup> *Ibid.*, 88.

**(2) After action reports have been studied by others but there is less comparative analysis of COOP plans or strategic documents—and less at the state or local level.**

Public safety agencies are creating doctrine that helps contribute to understanding organizational resilience, but no one has compared these documents in a systematic way. When the research for this thesis was being conducted there was comparative-level analysis attempted with ARRs; however, there is no equivalent comparative approach to examining planning or strategic doctrine. Existing research tended to approach reviewing such doctrine in a case study method, rather than from a comparative analysis. Increasing comparative analyses is one way to improve and expand upon existing literature.

Another way to improve and expand upon existing literature is by analyzing additional doctrine from the state and local levels. State and local public safety agencies represent a large number of entities within the homeland security enterprise. A broader representation of those agencies in the literature would be beneficial.

### **C. CONCLUSION**

Public safety agencies are engaged in activities that contribute to understanding resilience within their agencies. This thesis also found that New Zealand’s resilience management framework can provide a working construct for a better understanding of resilience within U.S. public safety agencies. Further, this thesis asserts that AARs should be standardized. It also suggests that making AARs publicly available further contributes to understanding organizational resilience.

Resilience has gained prominence in the homeland security enterprise lexicon. One of the ways to ensure we are achieving success, as defined by the National Preparedness Goal as “having a security and resilient Nation,” is by ensuring we have resilient public safety agencies, organizations that are key to the homeland security enterprise.<sup>234</sup>

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<sup>234</sup> Department of Homeland Security, *National Preparedness Goal*, 1.

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**APPENDIX A. ANALYSIS FOR SITUATIONAL AWARENESS AND  
MANAGEMENT OF KEYSTONE VULNERABILITIES  
ATTRIBUTES OF RESILIENCE**

Table 10. Detailed Completed Analysis Tool 1—Texas

<b>TEXAS</b>				
		<b>Resilience Indicator</b>	<b>COOP</b>	<b>Strategy</b>
<b>Situational Awareness</b>		SA 1 - Roles and Responsibilities	YES <sup>235</sup>	NO
		SA 2 - Understanding of Hazards and Consequences	NO	YES <sup>236</sup>
		SA 3 - Connectivity Awareness	NO	YES <sup>237</sup>
		SA 4 - Insurance Awareness	NO	NO
		SA 5 - Recovery Priorities	YES <sup>238</sup>	YES <sup>239</sup>
		<b>Resilience Indicator</b>	<b>COOP</b>	<b>Strategy</b>
<b>Keystone Vulnerabilities</b>		KV 1 - Planning Strategies	YES <sup>240</sup>	YES <sup>241</sup>
		KV 2 - Participation in Exercises	YES <sup>242</sup>	YES <sup>243</sup>
		KV 3 - Capability and Capacity of Internal Resources	NO	NO
		KV 4 - Capability and Capacity of External Resources	NO	NO
		KV 5 - Organizational Connectivity	NO	YES <sup>244</sup>

<sup>235</sup> Texas Department of Public Safety, *Draft Continuity of Operations Agency Plan*, 5–6.3.

<sup>236</sup> State of Texas, *Texas Homeland Security Strategic Plan*, 2010-2015, 8.

<sup>237</sup> Ibid.

<sup>238</sup> Texas Department of Public Safety, *Draft Continuity of Operations Agency Plan*, 11–12.

<sup>239</sup> State of Texas, *Texas Homeland Security Strategic Plan*, 50–60.

<sup>240</sup> Texas Department of Public Safety, *Draft Continuity of Operations Agency Plan*, 5.

<sup>241</sup> State of Texas, *Texas Homeland Security Strategic Plan*, 10–11.

<sup>242</sup> Texas Department of Public Safety, *Draft Continuity of Operations Agency Plan*, 18.

<sup>243</sup> State of Texas, *Texas Homeland Security Strategic Plan*, 55.

<sup>244</sup> Texas Department of Public Safety, *Draft Continuity of Operations Agency Plan*.

Table 11. Detailed Completed Analysis Tool 1—Virginia

VIRGINIA			
Resilience Indicator		COOP	Strategy
Situational Awareness	SA 1 - Roles and Responsibilities	YES <sup>245</sup>	NO
	SA 2 - Understanding of Hazards and Consequences	YES <sup>246</sup>	NO
	SA 3 - Connectivity Awareness	YES <sup>247</sup>	YES <sup>248</sup>
	SA 4 - Insurance Awareness	NO	NO
	SA 5 - Recovery Priorities	YES <sup>249</sup>	YES <sup>250</sup>
Resilience Indicator		COOP	Strategy
Keystone Vulnerabilities	KV 1 - Planning Strategies	YES <sup>251</sup>	NO
	KV 2 - Participation in Exercises	YES <sup>252</sup>	YES <sup>253</sup>
	KV 3 - Capability and Capacity of Internal Resources	NO	NO
	KV 4 - Capability and Capacity of External Resources	NO	NO
	KV 5 - Organizational Connectivity	YES <sup>254</sup>	YES <sup>255</sup>

<sup>245</sup> Commonwealth of Virginia, *Continuity of Government and Operations*, 2, 3, 4, 6, 8.

<sup>246</sup> Ibid., 2.

<sup>247</sup> Ibid., 3–6.

<sup>248</sup> Virginia Department of Emergency Management, *Strategic Plan*.

<sup>249</sup> Commonwealth of Virginia, *Continuity of Government and Operations*, 6–7. As with others, recovery priorities were mentioned but not detailed.

<sup>250</sup> Virginia Department of Emergency Management, *Strategic Plan*, 14–16.

<sup>251</sup> Commonwealth of Virginia, *Continuity of Government and Operations*, 2, 7.

<sup>252</sup> Ibid., 6. But poorly—vaguely mentioned managing COG exercises and testing, but no details.

<sup>253</sup> Virginia Department of Emergency Management, *Strategic Plan*, 5–6.

<sup>254</sup> Commonwealth of Virginia, *Continuity of Government and Operations*, 3–5. As it relates to COG.

<sup>255</sup> Virginia Department of Emergency Management, *Strategic Plan*.

Table 12. Detailed Completed Analysis Tool 1—Nebraska

NEBRASKA			
Resilience Indicator		COOP	Strategy
Situational Awareness	SA 1 - Roles and Responsibilities	YES <sup>256</sup>	NO
	SA 2 - Understanding of Hazards and Consequences	YES <sup>257</sup>	YES <sup>258</sup>
	SA 3 - Connectivity Awareness	YES <sup>259</sup>	YES <sup>260</sup>
	SA 4 - Insurance Awareness	NO	NO
	SA 5 - Recovery Priorities	YES <sup>261</sup>	NO
Resilience Indicator		COOP	Strategy
Keystone Vulnerabilities	KV 1 - Planning Strategies	YES <sup>262</sup>	YES <sup>263</sup>
	KV 2 - Participation in Exercises	YES <sup>264</sup>	YES <sup>265</sup>
	KV 3 - Capability and Capacity of Internal Resources	NO	NO
	KV 4 - Capability and Capacity of External Resources	NO	NO
	KV 5 - Organizational Connectivity	YES <sup>266</sup>	YES <sup>267</sup>

<sup>256</sup> Nebraska Emergency Management Agency, *Emergency Operations Plan*, 100, 129, 149, 155, 161, 165, 251, 260, 274, 313,324, 337, 352.

<sup>257</sup> *Ibid.*, 27.

<sup>258</sup> Nebraska Homeland Security Policy Group, *Homeland Security Strategy*, 7.

<sup>259</sup> Nebraska Emergency Management Agency, *Emergency Operations Plan*.

<sup>260</sup> Nebraska Homeland Security Policy Group, *Homeland Security Strategy*, 2–3.

<sup>261</sup> Nebraska Emergency Management Agency, *Emergency Operations Plan*, 89.

<sup>262</sup> *Ibid.*

<sup>263</sup> Nebraska Homeland Security Policy Group, *Homeland Security Strategy*, 3–4.

<sup>264</sup> Nebraska Emergency Management Agency, *Emergency Operations Plan*.

<sup>265</sup> Nebraska Homeland Security Policy Group, *Homeland Security Strategy*, 3–4, 6–7.

<sup>266</sup> Nebraska Emergency Management Agency, *Emergency Operations Plan*.

<sup>267</sup> Nebraska Homeland Security Policy Group, *Homeland Security Strategy*, 3–5.

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## APPENDIX B. ANALYSIS FOR ADAPTIVE CAPACITY ATTRIBUTES OF RESILIENCE

Table 13. Detailed Completed Analysis Tool 2—Broome County

Resilience Indicator		ACA AAR
Adaptive Capacity	AC 1 - Absence of Silo Mentality	Yes <sup>268</sup>
	AC 2 - Communication and Relationships	Yes <sup>269</sup>
	AC 3 - Strategic Vision and Outcome Expectancy	Yes <sup>270</sup>
	AC 4 - Information and Knowledge	Yes <sup>271</sup>
	AC 5 - Leadership, Management, and Governance Structure	Yes <sup>272</sup>

Table 14. Detailed Completed Analysis Tool 2—Boston

Resilience Indicator		Boston AAR
Adaptive Capacity	AC 1 - Absence of Silo Mentality	YES <sup>273</sup>
	AC 2 - Communication and Relationships	YES <sup>274</sup>
	AC 3 - Strategic Vision and Outcome Expectancy	YES <sup>275</sup>
	AC 4 - Information and Knowledge	NO
	AC 5 - Leadership, Management, and Governance Structure	YES <sup>276</sup>

<sup>268</sup> Beck Disaster Recovery, *American Civic Association Shooting After-Action Report*, 4, 6, 13–15, 21, 24, 32–34.

<sup>269</sup> *Ibid.*, 4, 6, 13–15, 21, 24, 32–34.

<sup>270</sup> *Ibid.*, 4, 5–6.

<sup>271</sup> *Ibid.*, 10, 13–14, 15.

<sup>272</sup> *Ibid.*, 13.

<sup>273</sup> Massachusetts Emergency Management Agency et al., *Boston Marathon Bombings*, 3, 9, 12–14, 16.

<sup>274</sup> *Ibid.*, 3, 9, 12–14, 16.

<sup>275</sup> *Ibid.*, 3.

<sup>276</sup> *Ibid.*, 17.



Table 15. Detailed Completed Analysis Tool 2—San Diego County

Resilience Indicator		Wildfire AAR
Adaptive Capacity	AC 1 - Absence of Silo Mentality	NO <sup>277</sup>
	AC 2 - Communication and Relationships	NO <sup>278</sup>
	AC 3 - Strategic Vision and Outcome Expectancy	YES <sup>279</sup>
	AC 4 - Information and Knowledge	NO
	AC 5 - Leadership, Management, and Governance Structure	YES <sup>280</sup>

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<sup>277</sup> San Diego Office of Emergency Management, *Wildfire After Action Report*, 8, 70–76.

<sup>278</sup> Ibid.

<sup>279</sup> Ibid., 8.

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