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THESIS

OUT FROM UNDER THE ROCK: IMPROVING FDNY INFORMATION SHARING

by

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March 2017

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As highlighted in the 9/11 Commission Report, the New York Police Department (NYPD) and Fire Department City of New York (FDNY) have suffered from a lack of inter-agency communication for many years, which is of particular detriment to the safety of front-line members of the FDNY. This thesis sought to find new solutions to the problem by analyzing the processes and policies driving communications to and within the FDNY and the degree to which they have changed since McKinsey & Company's analysis of the department in 2002. A study of organizational change theories, including Leavitt's Diamond, was used to analyze organizational change issues within the FDNY. Synthesizing these theories with the department's successful and failed change attempts produced a set of tasks to create and implement a new technology in the form of a mobile application called FDNY Mobile. This thesis concluded that improving information sharing between the FDNY and the NYPD is nearly impossible without first analyzing the information-sharing practices of an individual organization. Information sharing between these organizations must be reciprocal. This thesis found that without creating a sense of urgency and managerial support, FDNY Mobile will end in failure. Moreover, the FDNY needs to strengthen its own information-sharing practices before a more detailed focus is made on inter-agency information sharing with the NYPD.

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OUT FROM UNDER THE ROCK: IMPROVING FDNY INFORMATION SHARING

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ABSTRACT

As highlighted in the 9/11 Commission Report, the New York Police Department (NYPD) and Fire Department City of New York (FDNY) have suffered from a lack of inter-agency communication for many years, which is of particular detriment to the safety of front-line members of the FDNY. This thesis sought to find new solutions to the problem by analyzing the processes and policies driving communications to and within the FDNY and the degree to which they have changed since McKinsey & Company's analysis of the department in 2002. A study of organizational change theories, including Leavitt's Diamond, was used to analyze organizational change issues within the FDNY. Synthesizing these theories with the department's successful and failed change attempts produced a set of tasks to create and implement a new technology in the form of a mobile application called FDNY Mobile. This thesis concluded that improving information sharing between the FDNY and the NYPD is nearly impossible without first analyzing the information-sharing practices of an individual organization. Information sharing between these organizations must be reciprocal. This thesis found that without creating a sense of urgency and managerial support, FDNY Mobile will end in failure. Moreover, the FDNY needs to strengthen its own information-sharing practices before a more detailed focus is made on inter-agency information sharing with the NYPD.

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LIST OF ACRONYMS AND ABBREVIATIONS

ACLU	American Civil Liberties Union
app	mobile application
CRIMS	Critical Response Infrastructure Management System
CTDP	Center for Terrorism and Disaster Preparedness
DHS	Department of Homeland Security
EAM	Emergency Action Message
EMS	emergency medical services
EOC	emergency operations center
ERP	emergency response plan
FBI	Federal Bureau of Investigation
FDNY	Fire Department of the City of New York
FSIE	Fire Service Intelligence Enterprise
GIS	geographic information system
I&A	Intelligence and Analysis (DHS)
IC	intelligence community
JCAT	Joint Counterterrorism Assessment Team
LE	law enforcement
NYPD	New York Police Department
PSS	personal safety systems
Q1	first quarter
Q2	second quarter
SAR	suspicious activity report

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EXECUTIVE SUMMARY

Threat and safety information is not making it to front-line members of the Fire Department of the City of New York (FDNY). The FDNY's information-sharing processes need improvement in order to enhance the safety of all FDNY personnel. In response to 9/11, many scholars have researched inter-agency communication between the FDNY and the New York City Police Department (NYPD). Unfortunately, information-sharing practices between these agencies have not changed much despite ongoing scholarly research. Instead of trying to reinvent another solution to improve inter-agency communication, this thesis focused on the organizational information-sharing practices of the FDNY. Building an improved information-sharing network within the FDNY can create opportunity to enhance inter-agency information sharing. Metadata from DiamondPlate, the FDNY's information-sharing platform, highlights thin readership and a need for improvement. An FDNY survey of 500 firefighters and EMS personnel was conducted from 2014 to 2015, the results of which suggested that only half of the members surveyed actually use DiamondPlate. Poor DiamondPlate access and limited usage creates a potential information-sharing gap within the FDNY.

A.   METHODS

This research looked internally at the FDNY using a prescriptive paradigm to offer some information-sharing solutions. An analysis of DiamondPlate metadata provided by the platform's management team was conducted. In addition, the responses to the FDNY survey were analyzed. A study of organizational change theories, including Leavitt's Diamond, were used to analyze barriers to organizational change within the FDNY. Harold Leavitt's work views organizations as complex systems consisting of the following interacting variables: tasks, structure, technology, and people.[1] Leavitt posits, "These four are highly interdependent … so that a change in any one usually results in a

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[1] Harold J. Leavitt, "Applied Organizational Change in Industry: Structural, Technological and Humanistic Approaches," in *Handbook of Organizations*, ed. James G. March, 1144–1170 (Skokie, IL: Rand McNally, 1965), 1144.

compensatory (or retaliatory) change in the others."[2] Joseph Mosca and Stuart Rosenberg describe twenty factors that lead to organizational change resistance.[3] Ann Gilley, Jerry W. Gilley, and Marisha Godek support the idea of implementing change gradually. These authors suggest that people perceive gradual change as more manageable and adjust much better to changes that occur slowly.[4] Synthesizing these theories with successful and failed change attempts made by the department, analyzing deficiencies in DiamondPlate, and studying new technologies produced a set of tasks to create and implement a new technology in the form of an app called FDNY Mobile.

B.   CONCLUSIONS

The FDNY needs to strengthen its own information-sharing practices before a more detailed focus is made on inter-agency information sharing with the NYPD. There are a few reasons for DiamondPlate's low usage rate. First, members do not have access to this platform while off duty. Firefighter access is limited to the time on duty and when physically inside the firehouse. Another reason is, even if time permits, there is only one computer kiosk in each firehouse. This lone workstation is insufficient for accommodating four to ten firefighters working a given shift. Analyzing DiamondPlate metrics revealed that essential information is not reaching field personnel in a timely manner. Moreover, DiamondPlate is only used to push information. The department could benefit by using the virtual platform to pull operational intelligence and safety information from personnel in a timely fashion. Changing how the FDNY disseminates threat and safety information with members is not an easy task.

Studying examples of both failed and successful FDNY changes, along with the organizational change theories, helped define some of the barriers that have restrained the FDNY. Without the right execution, any attempt to change a procedure within the FDNY

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[2] Ibid.

[3] Joseph Mosca and Stuart Rosenberg, "Breaking Down the Barriers to Organizational Change," *International Journal of Management and Information Systems* 15, no. 3 (2011): 141, doi: 10.19030/ijmis.v15i3.4650.

[4] Ann Gilley, Jerry W. Gilley, and Marisha Godek, "Change, Resistance, and the Organizational Immune System," *SAM Advanced Management Journal* 74 (September 2009): 7.

is set up for failure. The vast majority of change in the FDNY occurs in a reactive rather than a proactive fashion. Initiatives that have failed to change the department in some way include the 2007 FDNY intelligence strategy, the development of an FDNY suspicious activity report program, and the implementation of an emergency action message.

Analyzing the positive FDNY change examples could provide future endeavors a blueprint for successful implementation. Three successful FDNY change initiatives were analyzed in this thesis. The first included the way information is shared with members through DiamondPlate technology. The second successful example analyzed the creation of an FDNY Rescue Task Force. The third studied how the department added new safety equipment, such as bunker gear, and the personal safety system. DiamondPlate proved the department can implement successful changes in a proactive manner. However, the information-sharing platform does have its shortcomings. Without managerial support, most change initiatives within the FDNY will fail.

C.   RECOMMENDATIONS

Developing an FDNY mobile app could enhance the safety of all department personnel. As DiamondPlate and survey data suggest, many members in the FDNY remain uninformed and this lack of awareness creates an unsafe condition during responses while potentially inhibiting information sharing among members. Developing an FDNY app helps solve the problem of reaching off-duty members as opposed to only those physically working at a firehouse or EMS station. This thesis presents eight recommendations to guide the FDNY through organizational change barriers to successfully implement FDNY Mobile. The FDNY must adopt a new information-sharing strategy. It is critical to create a sense of urgency in order to drive managerial support for FDNY Mobile.

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I. INTRODUCTION

On September 27, 2016, Fire Department of the City of New York (FDNY) firefighters responded to a natural gas emergency, one of thousands the department mitigates each year. When firefighters gained access to the residence, they uncovered what looked like a homemade drug laboratory. The room was dark and appeared to be filled with drug paraphernalia. The firefighters immediately retraced their steps, evacuated the occupancy, and called for backup.[1] Fire personnel evacuated the multi-family home, ensured the street was blocked off from public traffic, and awaited Con Edison, the gas utility, in the street.

Meanwhile, Battalion Chief Michael J. Fahy stood in the street managing the scene from a location every incident commander stages, seemingly out of harm's way. Suddenly, suspect Julio Saucedo tried to flee the scene. Fearing Saucedo's car would ignite an explosion, Chief Fahy confronted the suspect in front of the building.[2] It was during this interaction that, without warning, the house exploded. A large section of roof blew off the top of the home and landed on top of the chief. In addition to Chief Fahy, six police officers and nine firefighters were injured at the scene.[3] Unfortunately, after being rushed to the hospital in a police car, Chief Fahy—loving husband and father of three young children—passed away.

Had the responding companies known from the beginning that the residence was used as a drug lab, fire department operations would not have committed such a large number of resources to the occupancy or staged the incident command post so close to the scene. In the aftermath of the tragedy, it would be revealed that law enforcement had received an anonymous tip about the potential drug lab a few weeks before the explosion.

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[1] Jennifer Bain et al., "FDNY Battalion Chief Killed When Marijuana Grow House Explodes," *New York Post*, September 27, 2016, http://nypost.com/2016/09/27/firefighters-respond-to-reported-house-explosion-in-the-bronx/.

[2] Leonard Green and Ross Keith, "FDNY Chief Michael Fahy Encountered Bronx Drug House Suspect before Fatal Explosion," *New York Daily News*, October 1, 2016, http://www.nydailynews.com/new-york/bronx/fdny-chief-confronted-bronx-drug-house-suspect-fatal-blast-article-1.2813680.

[3] Bain et al., "FDNY Battalion Chief Killed."

Nevertheless, intelligence of this kind—no matter its source—rarely gets to front-line members of the FDNY. Finding a way to share this type of intelligence may have prevented fifteen police officers and firefighters from getting injured and perhaps could have saved the life of Chief Fahy.

A. PROBLEM STATEMENT

In 2015, the FDNY set a new record after responding to 1.7 million emergencies.[4] Some were very similar to the incident that killed Chief Fahy. Within this heightened level of activity, which is forecast to intensify in future years, the FDNY has a significant deficiency in its intelligence operations: there are no formal programs or procedures in place that organize department efforts for gathering or collecting information into processed, analyzed, and finished intelligence products. In addition, there is no established framework in which this intelligence is shared with any of the three FDNY branches, members of law enforcement (LE), or the intelligence community (IC).

From an operational perspective, the fire department and the IC are not taking full advantage of unobstructed access available to front-line units of the FDNY. Personnel from all three branches of the FDNY (fire, fire prevention, and emergency medical services [EMS]) have uncovered suspected terrorist activity during routine building inspections, the investigation of complaints, and daily emergency responses. The suspicious activities or behaviors that these members discover lead to vast amounts of raw information that makes its way to the FDNY's Terrorism Awareness Unit. However, there is no framework through which this information is processed, exploited, analyzed, and shared.

The FDNY's current internal doctrine stresses the importance of passing information up the chain of command when appropriate.[5] This vertical dissemination can be viewed with some negativity because this method tends to silo the information among

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[4] Jennifer Fermino, "FDNY Responded to Record Number of Fire Calls in 2015, but Deaths Were Down," *New York Daily News*, January 8, 2016, http://www.nydailynews.com/new-york/fdny-responded-fires-2015-deaths-article-1.2490523.

[5] Current FDNY Regulations and Emergency Response Plan bulletins only discuss sharing suspicious activity vertically up the chain of command and with internal fire marshals. There are no policies written to share with law enforcement or other members of the intelligence community.

administration and headquarter elements of the FDNY. An alternative to be examined is horizontal dissemination, i.e., sharing information across the community, which can ensure that key intelligence is operationalized and front-line members are informed and aware, giving them the best chance to remain abreast of terror and criminal activity, contribute to city counterterrorism efforts, and return home safely. Due to a lack of emphasis and little coordinated processes or operating frameworks, the horizontal dissemination of information continues to be a slow and cumbersome process for the FDNY.

Concomitantly, and attributed to lapses in intelligence dissemination in and to the FDNY, there is a receptivity and consumption problem in which intelligence is not fully interpreted or effectively used at the front lines. Despite efforts to share information among personnel in the field, a lack of real-time situational awareness continues to exist. This problem has negatively impacted all members of the FDNY because important intelligence, brought to light by active and deployed firefighters in the workforce, is not making it to the front lines of the operating firefighting environment. Possible causes for this problem are an outdated FDNY dissemination framework and little to no use of established technologies, including FDNY's department-wide DiamondPlate information-sharing platform, which is networked and available to all members. Included in this thesis is a study grounded in research that investigates and describes an alternative framework using Leavitt's Diamond and tailored technological solutions that can incorporate the FDNY's DiamondPlate program. By doing this, an effective FDNY intelligence-dissemination model is established and achieves full utilization of collected, analyzed, and reported intelligence that is actionable and current.

B.   RESEARCH QUESTION

In an effort to improve the dynamics of information sharing by the FDNY, this thesis attempts to answer the following key question:

How can the FDNY better inform its members about threat and safety information to improve situational awareness?

This research question looks internally at one department using a prescriptive paradigm to offer some solutions. In the process of answering this primary inquiry, the thesis also explores the following sub-questions:

1.   How does the FDNY share and receive information?

2.   How are members from both fire and EMS currently informed of suspicious activity?

3.   What mobile technologies are available to improve current intelligence practices?

4.   What are the organizational change barriers when implementing new technology within the FDNY, and what can be done to mitigate them?

5.   How can mobile technology better connect the New York City Police Department (NYPD) and the FDNY?

C.   LITERATURE REVIEW

Welcoming the fire service into the intelligence community is not a new idea. In fact, there are many policies and experts opining as to how best to incorporate these two entities together. Included in this review are several post-9/11 government documents that indicate the importance of intelligence sharing, government support for fire service intelligence, current fire service intelligence initiatives, and several theses focused on these subjects.

1.   Information Sharing

Long before the infamous 9/11 terrorist attacks in New York City, President Ronald Reagan issued an executive order regarding U.S. intelligence activities. The executive order reads, "State, local, and tribal governments are critical partners in securing and defending the United States from terrorism and other threats to the United States and its interests. Our national intelligence effort should take into account the responsibilities and requirements of State, local, and tribal governments … when undertaking the collection and dissemination of information and intelligence to protect

the United States."[6] Literature published decades later continues to call for many of the same initiatives.

Shortly after the attacks of 9/11, the Department of Homeland Security (DHS) was tasked, along with other agencies, to work on strengthening information sharing. According to DHS, "Remedying information sharing shortfalls was a principal recommendation of the 9/11 commission. … In the ten years since 9/11, the federal government has strengthened the connection between collection and analysis on transnational organizations and threats. Terrorism-related information sharing across the intelligence community has greatly improved."[7] More specifically, the organization posits that there has been great success in sharing intelligence on threats, which is useful for state and local law enforcement as well as homeland security personnel.[8] These claims fall in line with some of the goals set forth in the *National Strategy for Information Sharing*. In 2007, President George W. Bush recognized that local agencies play a significant role in daily counterterrorism activities. According to the White House, local agencies "require access to timely, credible, and actionable information and intelligence about individuals and groups intending to carry out attacks in the United States."[9] Additional literature was published to discuss the importance of information sharing between all levels of government.

President Barack Obama reiterated this idea in 2012 with his *National Strategy for Information Sharing and Safeguarding*. President Obama states, "Our national security depends upon an ability to make information easily accessible to Federal, state, local, tribal, territorial, private sector, and foreign partners in a trusted manner, given the

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[6] "Executive Order 12333: United States Intelligence Activities," Federation of American Scientists, accessed July 24, 2016, https://fas.org/irp/offdocs/eo/eo-12333-2008.pdf.

[7] "Information Sharing," Department of Homeland Security (DHS), August 26, 2015, https://www.dhs.gov/topic/information-sharing.

[8] Ibid.

[9] The White House, *National Strategy for Information Sharing* (Washington, DC: The White House, 2007), https://www.ise.gov/sites/default/files/nsis_book_0.pdf.

appropriate mission context."[10] Within this strategy, President Obama discusses the operating environment, including threats to national security and information-sharing weaknesses. In addition, the President presents goals that include improving collaboration, increasing common processes, improving information discovery, and providing access through common standards.[11] Larry Thompson, former United States Deputy Attorney General, takes it a step further and analyzes the lack of information sharing in a more critical way. These claims support the *9/11 Commission Report* findings that a lack of information sharing was a contributing factor in the failure to prevent the 9/11 attacks.[12]

2. Intelligence Cycle

While the focus of this thesis is on improvement of intelligence dissemination, the intelligence cycle plays a crucial role in the process. There is a vast amount of literature that discusses the intelligence cycle. The literature on the subject varies slightly from one organization to the next. Several past theses on the subject of fire service intelligence have analyzed the intelligence cycle in great detail. Many homeland security organizations provide their own model of the intelligence cycle. The U.S. Army's open-source intelligence model describes an intelligence process that consists of four steps—planning, preparing, collecting, and producing—and four continuing activities—analyzing, generating intelligence knowledge, assessing, and disseminating.[13]

The Federal Bureau of Investigation's (FBI) intelligence cycle, on the other hand, consists of six steps:

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[10] Barack Obama, *National Strategy For Information Sharing and Safeguarding* (Washington, DC: The White House, 2012, https://obamawhitehouse.archives.gov/sites/default/files/docs/2012sharingstrategy _1.pdf.

[11] Ibid.

[12] "The 9/11 Commission Report," National Commission on Terrorist Attacks Upon the United States, accessed March 6, 2017, http://www.9-11commission.gov/report/; Larry D. Thompson, "Intelligence Collection and Information Sharing within the United States," Brookings, December 8, 2003, http://www.brookings.edu/research/testimony/2003/12/08terrorism-thompson.

[13] Department of the Army, *Open-Source Intelligence* (ATP 2-22.9) (Washington, DC: Department of the Army, 2012), https://fas.org/irp/doddir/army/atp2-22-9.pdf.

Requirements are identified information needs—what we must know to safeguard the nation. … **Planning and direction** involve management of the entire effort, from identifying the need for information to delivering an intelligence product to a consumer. … **Collection** consists of gathering of raw information based on requirements. … **Processing and Exploitation** involves converting the vast amount of information collected into a form usable by analysts. … **Analysis and Production** describe the conversion of raw information into intelligence. … **Dissemination**—the last step—includes distributing raw or finished intelligence to the consumers whose needs initiated the intelligence requirements. Movement through each step is fluid and requires active collaboration.[14]

Other literature on intelligence shows a more complex process. Mark Lowenthal criticizes the FBI, Central Intelligence Agency (CIA), and other foreign intelligence models in his book, *Intelligence: From Secrets to Policy*. Lowenthal describes the CIA's circular representation of the process as an overly simple process that omits feedback.[15] He proposes a multi-layered seven-step intelligence process that includes feedback as a step. Lowenthal integrates feedback between the other six steps throughout the process.[16] He believes that this model "gives a much better sense of how the intelligence process operates on reality, being linear, circular, and open-ended all at the same time."[17] This model counters other literature on the intelligence cycle as it provides the flexibility to change various parts of the process as necessary.

3.   Fire Service Intelligence

The creation of the Fire Service Intelligence Enterprise (FSIE) in 2007 initiated a flurry of interest about the role of the fire service in terrorism-related information sharing. Over the course of the next several years, leaders in the fire service exchanged ideas to better include the fire service in the IC. Many of these ideas originated from theses that discuss the benefits and goals of the FSIE. According to Thomas Richardson, then battalion chief of the FDNY, "The FSIE was established by DHS because both the IC and

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[14] "Directorate of Intelligence," Federal Bureau of Investigation (FBI), accessed July 22, 2016, https://www2.fbi.gov/intelligence/di_cycle.htm.

[15] Mark M. Lowenthal, *Intelligence: From Secrets to Policy*, 6th ed. (Washington, DC: CQ Press, 2015), 83.

[16] Ibid., 85.

[17] Ibid., 84.

the fire service recognized that firefighters played an important role in the intelligence process."[18] It was argued by some that the FSIE still needed improvement, however. The need for FSIE improvement became evident shortly after the United States Fire Administration began overseeing the initiative.[19] In another thesis, graduate student Thomas Robson, an FDNY battalion chief, argued that while "the FSIE was a step in the right direction … this system still did not address the needs of the fire department in its local community."[20] Graduate student Joshua M. Dennis, a Chicago district chief, presented another weakness within the FSIE in 2012. He stated, "Smaller fire departments and fire departments without the resources to dedicate personnel and resources to either an internal intelligence unit or a law enforcement fusion center have no formal mechanism to receive intelligence or provide information to intelligence assets."[21]

Many of these theses have shown the advantages of the FSIE. This includes improved information sharing between homeland security partners and the fire service as well as instructions on how to incorporate intelligence education into firefighter and EMS personnel training. While there continues to be literature published discussing the importance of information sharing, there are no current documents discussing the FSIE. After DHS Intelligence & Analysis (I&A) left the initiative, the FSIE dissolved.

In 2010, DHS and the Department of Justice issued an appendix called *Fire Service Integration for Fusion Centers* to the *Baseline Capabilities for State and Major Urban Area Fusion Centers* publication. These guidelines are a part of the U.S. Department of Justice's Global Justice Information Sharing Initiative. This document provided a framework for integrating state and major urban area fusion centers and the fire service into the fusion process. DHS states, "Though once thought of as relating only

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[18] Thomas J. Richardson, "Identifying Best Practices in the Dissemination of Intelligence to First Responders in the Fire and EMS Services," (master's thesis, Naval Postgraduate School, 2010), 2.

[19] Ibid., 46.

[20] Thomas A. Robson, "A Burning Need to Know: The Use of Open Source Intelligence in the Fire Service," (master's thesis, Naval Postgraduate School, 2012), 14.

[21] Joshua M. Dennis, "Standing on the Shoulders of Giants: Where Do We Go from Here to Bring the Fire Service into the Domestic Intelligence Community?" (master's thesis, Naval Postgraduate School, 2012), 2.

to prevention, protection, and investigation missions, information and intelligence are now also recognized as important elements for execution of response and recovery missions."[22] This document analyzes how to best incorporate the fire service into current fusion center analysis as well as the different information-sharing processes. Much of the literature and discussion on fire service information sharing has waned in recent years. However, there is some literature that continues to push for intelligence inclusion and education for the fire service.

In November of 2014, the United States Fire Administration issued a report, *Fire Service Information Sharing*, to inoculate members of the fire service into the intelligence community and culture. The Joint Counterterrorism Assessment Team (JCAT) released the 3rd edition of the *Intelligence Guide for First Responders* in 2015. JCAT has continued the work that the Interagency Threat Assessment and Coordination Group started with the first edition of this document in 2009. These documents have provided a baseline for understanding intelligence definitions, roles, and processes among the first responder community, as well as the importance of first responders in the IC. JCAT states, "Law enforcement, fire service, and emergency medical services personnel play a vital role in detecting and preventing attacks because of the nature of their work, their frequent interaction with members of the public, and the level of access their jobs provide."[23] This document reiterates language found in Executive Order 12333, *United States Intelligence Activities*, signed by President Ronald Reagan in 1981. All first responders are recognized as playing a role in homeland security.

4. Leavitt's Diamond

There are several theories that describe approaches to organizational change. Changing the way the FDNY collects, disseminates, and receives information to and from its members, as well as other homeland security partners, is not an easy task. The sheer

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[22] Global Justice Information Sharing Imitative, *Fire Service Integration for Fusion Centers* (Washington, DC: Department of Justice, 2010), https://it.ojp.gov/documents/d/Fire%20service%20 integration%20for%20Fusion%20Centers.pdf.

[23] Joint Counterterrorism Assessment Team (JCAT), *JCAT Intelligence Guide for First Responders* (Washington, DC: National Counterterrorism Center, 2015), https://www.nctc.gov/jcat/docs/ Intelligence_Guide_for_First_Responders.pdf.

size of the department makes the notion appear daunting. Among the literature researched, work by Harold J. Leavitt is the most promising to help the FDNY build a better intelligence collection and dissemination framework.

Leavitt's Diamond describes four subjects as a framework for managing change within an organization: tasks, people, technology, and structure. Robert C. King III, graduate of the Naval Postgraduate School, used this model in his thesis to determine how to best implement data-driven decision-making strategies for DHS. In *The Department of Homeland Security's Pursuit of Data-Driven Decision Making*, King applies research data into three of the four diamond dimensions and categorizes themes as factors that will either impede or facilitate the goals of achieving data-driven decision making.[24]

Research done by Chapple and Sayles has demonstrated some structural approaches that focus more on people than tasks. They posit that an organization changes structure to change people to improve task performance.[25] For example, if the FDNY were to change its system for disseminating information, the situational awareness of firefighters and EMS personnel would improve.

5.   Conclusion

This literature highlights several gaps that continue to exist in today's fire service and the IC. None of the information-sharing and intelligence cycle literature discusses the fire service in any way. However, many of the policies and initiatives presented show relevance to the fire service, particularly the FDNY. Further analysis could enhance information dissemination practices within the FDNY.

While aspects of the FSIE literature presented here changed the FDNY for the better, the department still has work to do to improve information-sharing practices. This work is clearly presented in the McKinsey & Company report, *Increasing FDNY's*

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[24] Robert C. King III, "The Department of Homeland Security's Pursuit of Data-Driven Decision Making," (master's thesis, Naval Postgraduate School, 2015), 129–133.

[25] E.D. Chapple and L.R. Sayles, *The Measure of Management* (New York: Macmillan, 1961).

Preparedness.[26] The FDNY is a local organization whose potential contributions to the IC and LE are under utilized and squandered. While some of the literature discusses the IC working from the bottom up, it rarely gets to the root of an organization. For example, Dennis's thesis "examined options at a 10,000 foot level for organizational sharing."[27] This also holds true for much of the government literature published on the subject of information sharing and fire service intelligence. Addressing these gaps in the literature at the individual organization level could yield a model for other departments to utilize. This could enhance communication with front-line members as well as improve information sharing with homeland security partners.

D.   RESEARCH DESIGN

(1)   Object

The unit of study for this research is the intelligence practices of the FDNY. This includes all fire and EMS personnel as well as fire investigation personnel. FDNY data show that an analysis of the current state of FDNY intelligence practices is necessary. The goal of this thesis is to propose possible solutions to improve dissemination within and by the FDNY. This includes analyzing the current framework that exists to exploit areas that need improvement. Comparative analyses of different technologies and mobile apps are a part of this research. Building a new information-sharing framework for the FDNY is also a part of this research.

(2)   Selection

The FDNY continues to be the premier fire department in the United States.[28] The department recognizes its role as a leader in the fire service. As such, with the development of the Center for Terrorism and Disaster Preparedness (CTDP), the FDNY continues to push the fire service into new areas of homeland security. Describing

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[26] McKinsey & Company, *Increasing FDNY's Preparedness* (New York: FDNY, 2002), https://www1.nyc.gov/assets/fdny/downloads/pdf/about/mckinsey_report.pdf.

[27] Dennis, "Standing on the Shoulders of Giants," 49.

[28] "Firefighting in the U.S.: 100 Noteworthy Fire Departments," Online Fire Science Degree, accessed July 16, 2016, http://onlinefiresciencedegree.org/noteworthy-fire-departments/.

alternatives to better enhance information sharing and intelligence within the FDNY could positively influence other departments to take on the challenge as well.

(3)   Limits

Research for this project is strictly limited to improving current FDNY information-sharing practices. The study of how to apply this research to routine FDNY communications is outside the boundaries of this project. Research on how to impact routine communications with firefighters and EMS personnel is worth future consideration for those who choose to build on this research.

(4)   Data Sources

Evidence for this project comes from literature that discusses information sharing, the intelligence cycle, the FSIE, FDNY doctrine, and the effects of utilizing mobile technology. Hard data highlighting the usage of the current FDNY dissemination technology is included in this research, in addition to an FDNY survey of outgoing terrorism awareness students. FDNY Battalion Chief Thomas Robson developed and oversees the FDNY terrorism awareness class. The author of this thesis obtained permission from Chief Robson to use the data from his survey in this research. The survey was administered to over 500 FDNY terrorism awareness students to assess their usage of DiamondPlate, mobile technology such as apps and social media, awareness and readership of *Watchline* (an FDNY intelligence product), and how they obtain department news and information while off duty. The anonymous survey does not contain any personally identifiable information. The analysis of this survey highlights potential information-sharing and intelligence gaps that currently exist within the FDNY.

(5)   Types and Modes of Analysis

The focus of this project is to provide a set of recommendations for improved information sharing and intelligence dissemination within and by the FDNY. The thesis uses a policy analysis to expose intelligence gaps that currently exist within the FDNY. Next, it identifies how these gaps are affecting the situational awareness of FDNY personnel. Then it presents a comparative analysis of specific technologies that could

help the department determine its best options for improving current dissemination policies and practices. Last, with these potential technological improvements, it provides a new framework for the handling of suspicious activity reporting within the FDNY in conjunction with the NYPD and the Joint Terrorism Task Force.

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II.   THE STATE OF FDNY INTELLIGENCE AND INFORMATION SHARING TODAY

The situational awareness of the FDNY's personnel is greatly tied to how well the department collects and disseminates intelligence from its members and outside agencies. If the FDNY can properly collect, vet, and disseminate intelligence to its workforce in real time, members can have enhanced astuteness to the environment around them. These members can then use that improved situational awareness to contribute to the IC and LE. Most importantly, enhanced situational awareness could positively impact the safety of fellow members of the department.

This chapter analyzes the procedural and tactical literature of the FDNY to better understand the current state of FDNY intelligence. It also synthesizes this collection of documents to identify potential gaps in members' situational awareness and the dissemination of information within the FDNY. The analysis includes recommendations from the McKinsey report, which reviewed the department after 9/11; the FDNY's use of push–pull intelligence; the FDNY's use of geographic information system (GIS) technology; and an analysis of FDNY metadata from the department's web-based information-sharing platform, DiamondPlate.

A.   MCKINSEY REPORT

McKinsey & Company's August 2002 report examined the FDNY's response to 9/11 by analyzing how the department shared information during and after the event.[29] According to the FDNY, "McKinsey & Company spent five months working with Department personnel to develop recommendations to enhance the Fire Department's readiness and preparedness."[30] The independent report provides insight into how the department can increase operational preparedness as well as improve planning and management, communications, and technology capabilities.[31] Of the recommendations

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[29] McKinsey & Company, *Increasing FDNY's Preparedness*.

[30] Ibid., 3.

[31] Ibid.

from the McKinsey report, several are still relevant some fourteen years later. This research focuses on two of these recommendations—enhanced communications processes and technologies, as well as efficient information sharing at all levels of government. The FDNY's commitment to implementing and improving upon these recommendations could lead to better dissemination of intelligence and, in turn, better situational awareness for all FDNY members.

While the department has aligned itself with many of McKinsey's recommendations, internal information sharing and external intelligence sharing still require attention. Improvements are still needed with initiatives to enhance the push and pull of vital information to and from the workforce, establish interoperable communication infrastructure and protocol, improve inter-agency exchange of intelligence, and ensure this intelligence is shared quickly during emergencies and routine operations.[32]

The McKinsey report explains that while several initiatives between senior leaders of the NYPD and FDNY began after 9/11, more needs to be done.[33] Efforts from both agencies as well as from other homeland security partners are a step in the right direction. However, over a decade later, the same message still holds true—more can be done. The significance of this message is especially evident when analyzing current FDNY intelligence dissemination practices. While the McKinsey report provides some important insight into FDNY culture and processes, there are some glaring omissions. Though the report points out the urgent need for better critical information sharing between agencies, it does not address how to better disseminate intelligence to all members of the FDNY. Nor does it provide recommendations to improve inter-agency intelligence sharing that aids in prevention and deterrence of terrorism. If these were addressed, the safety of members would be improved. These gaps remain some of the FDNY's biggest counterterrorism challenges to date. While McKinsey & Company recognized the importance of information sharing, the NYPD shares very little pertinent information with the FDNY. And while the FDNY has made efforts to improve

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[32] Ibid.

[33] Ibid.

information sharing within the department, it remains an uphill battle with often slow and inefficient dissemination as the result.

B.   PUSH–PULL INTELLIGENCE

The FDNY needs to do a better job of "pulling" information from the outer edge of the workforce and then "pushing" that vetted intelligence out to the entire department, as described by FDNY Deputy Chief Thomas Currao.[34] This intelligence comprises observations of front-line FDNY members in the field. This raw information may prove useful and could become part of a finished intelligence product. It is possible that front-line members of the FDNY, as well as those in the IC and LE, would benefit from additional human intelligence from homeland security professionals on the ground. Sharing FDNY intelligence with other organizations like DHS and the NYPD would strengthen the intelligence capabilities of LE and the IC.

Chief Currao's article is the only FDNY source that discusses the difference between the push and pull of intelligence for the fire service. This document on fire service intelligence contends, "The 'pull' of information refers to what the fire service needs, with regard to information and intelligence necessary in order to prepare, train and operate within a multi-faceted and often dynamic threat. The 'push' occurs as this information is processed, analyzed and viewed through our unique lens."[35] Improved information sharing within the department begins with clear policies and procedures.

The department recognizes the value of timely reporting of vital information. For example, if a unit has an unusual occurrence while working with another city agency, it must notify headquarters of the particular details within twenty-four hours. According to FDNY regulations, the Bureau of Operations must receive the unusual occurrence report via facsimile no later than 0900 hours the following business day.[36] This is to ensure that chiefs at the highest level are aware of the incident, in case another city agency calls to

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[34] "Make the Right Call," Center for Terrorism and Disaster Preparedness, Fire Department of the City of New York, September 12, 2014 [FDNY intranet].

[35] Ibid.

[36] Fire Department of the City of New York (FDNY), *Regulations*: *Chapter 30* (DCN: 1.09.02) (New York: FDNY, 1997), 6; FDNY, *Regulations: Chapter 11* (DCN: 3.01.00) (New York: FDNY), 20.

discuss the event. The same commitment to quickly sharing intelligence with other agencies or even the outer edge of the FDNY workforce is missing in the FDNY's official publications. Improving FDNY policy on information sharing will allow the department to streamline the pulling of potential intelligence from a front-line member. The department can then utilize specific technologies to push that information to the workforce. Perhaps a more efficient information-sharing procedure will enhance members' situational awareness. There is no tactical or procedural literature like Chief Currao's article found within fire department manuals. His article was published internally on DiamondPlate, but, ironically, was not widely dispersed.

C.   *WATCHLINE*

One type of FDNY product pushing intelligence to the outer edge of the workforce is *Watchline*. The FDNY's expanded role within the IC is evident through this report's weekly dissemination. According to the FDNY's 2011 *Counterterrorism and Risk Management Strategy*, *Watchline* "sets the standard of fire service intelligence, is distributed both internally and externally, reaches 100 agencies from all levels of government and more than 1,000 direct subscribers outside the FDNY."[37] The overall readership is even more substantial. The publication asserts email forwarding by department members as well as outside agencies from around the world has increased weekly readership to more than 40,000 consumers.[38] *Watchline* is the only intelligence product from the FDNY or any other agency in the nation that finds its way into the hands of front-line FDNY members. This is an essential tool to help inform members of current threats and enhance their situational awareness.

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[37] FDNY, *FDNY Counterterrorism and Risk Management Strategy* (New York: FDNY, 2011), 9, https://www1.nyc.gov/assets/fdny/downloads/pdf/FDNY_ct_strategy_2011_12.pdf.

[38] Ibid.

D. PASS IT ON PROGRAM

Despite the major loss of seasoned firefighters on 9/11, the FDNY still has some of the most experienced members of any fire department. According to Jennifer Fermino, "The 1,747,345 calls the FDNY responded to in 2015 was 6.4% higher than the previous year's number."[39] As one of the busiest departments in the country, even the newest members have experiences to share. The FDNY started a program in 1997 called Pass It On. According to the department, the program was designed to relay experiences quickly and accurately to the field so that members of the department may save someone's life tomorrow.[40] Hard copies of these bulletins are sent to field units via department messenger vehicle. These bulletins are only accessible from within the firehouse or EMS station where they are posted for on-duty members to review. Disseminating this type of information in this manner leads to inconsistent viewership. In addition to potentially saving someone's life, the Pass It On Program captures the details of an emergency call to help make mitigation easier in the future. The flyer in Figure 1 represents an example of a Pass it On Program memo affecting the situational awareness of everyday response.

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[39] Jennifer Fermino, "Record Number of Fire Calls."

[40] FDNY, "Pass It On Program," (Safety Bulletin 90, FDNY, October 13, 2015), 1.

PASS IT ON PROGRAM
Bureau of Operations
Issue 4/2014
Date 5/2014

PROPANE USED DURING SUICIDE

PARTICULARS OF THE INCIDENT:

An engine company and ambulance were dispatched to a report of an unconscious person. When they arrived at the scene they found the victim in a top floor apartment of a 6 story "H" type multiple dwelling who had committed suicide using a plastic "exit bag". The bag was placed over the victim's head and secured with rubber bands. There was a hose coming from the bag attached to a 20 lb. propane cylinder. The victim had lit eight to ten cigarettes and let them burn on a plate next to the bed. The intention is not known for sure but it is possible that this might have created an explosion or fire. At this incident there was no odor of gas present to warn the first responders as the propane cylinder had been depleted and the gas had dissipated. Suicide bag or "exit bag" incidents are on the rise in this country. They are often used with an inert gas such as nitrogen or helium, which are both simple asphyxiants. Propane and natural gas are readily available and can also be used as a simple asphyxiant but flammability creates a dangerous situation for the first responders.

LESSONS LEARNED OR REINFORCED:

1. Members must strive to maintain situational awareness and be alert for signs that an incident that is considered routine could be taking a different turn.

2. When encountering strong odors of gas members should consider this an immediately dangerous to life and health (IDLH) atmosphere.

3. Units should not operate alone. They should transmit appropriate signal(s) and request necessary resources.

4. Proper PPE should be donned; a water source located and prepare to stretch a precautionary line. EMS units should retreat to a safe location and establish staging.

5. Consider that this is a crime scene. The medical treatment of people is paramount, but once a presumption of death is made nothing should be disturbed. "Touch nothing, do nothing"; back out and notify proper authorities.

Figure 1. Pass It On Program Document[41]

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[41] Photo obtained from the quarters of Engine 247.

E.   DIAMONDPLATE

DiamondPlate is the FDNY's agency-wide intranet information system. According to a *Fire Engineering* article by FDNY Chief Ronald Spadafora and FDNY Director of Technology Thomas Dowling, the FDNY lost an immense amount of experience and expertise after the 9/11 attack.[42] This type of knowledge was not easily replaced. The two authors suggest, "DiamondPlate was born out of a need to preserve the collective knowledge that the FDNY builds on every day."[43] Through proper planning and grant funding, DiamondPlate continues on as the only digital information-sharing platform between the FDNY and its members.

1.   DiamondPlate Data

This section analyzes metadata from the DiamondPlate platform. The platform's management team at FDNY headquarters provided metadata for the first two quarters of 2016. The data are supposed to reach all of the FDNY's firehouses —218 of them— along with 34 EMS stations, 10,322 fire personnel, and 3,675 EMS personnel.[44] DiamondPlate data are emailed to specific FDNY personnel and present the usage and reach of the department's intranet platform. DiamondPlate does not track unique views. More specifically, it does not track individual users, which would require users to log in. Aside from a posted copy, DiamondPlate is where members can read a digital copy of *Watchline*.

Before analyzing the data, it is important to understand the definition of the terms "visit" and "view" as they are used in the datasets. Opening a web browser that goes directly to DiamondPlate's homepage counts as one *visit*. A visit is terminated when the user closes the browser or after a period of inactivity (no movement of mouse or webpage) lasting more than a few minutes. A *view* occurs when someone clicks on a

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[42] Thomas Dowling and Ronald Spadafora, "FDNY DiamondPlate," *Fire Engineering* 166, no. 5 (May 2013): 30.

[43] Ibid.

[44] "FDNY Vital Statistics Fiscal Year 2014," accessed March 6, 2017, http://www.nyc.gov/html/fdny/pdf/vital_stats_2014_fy.pdf.

particular story of interest, and the browser takes that person to a specific page. Views are supposed to provide an accurate reflection of total pages seen.

a.   2016 First Quarter Data

The total number of locations reporting included 218 firehouses, 34 EMS stations, 16 administrative locations at headquarters, the fire academy, Fort Totten, and three Bureau of Fire Investigation locations. From January 1 to March 31, the total number of visits for the first quarter (Q1) was 71,721. There were seventy-seven feature stories that included terrorism-related information, medical response considerations, training information, and internal intelligence. There were 18,989 total views for a seven-day period. Dividing the total number of views by 77 features yields an average of 247 views per feature. Data collection stopped after seven days.

Views for one EMS story were a bit of an anomaly. This particular story on new spinal motion restriction protocol produced 2,494 views. Without the EMS feature, there were 16,495 total views. Notably, there was no metric for unique views. The Center for Terrorism and Disaster Preparedness (CTDP) writes most of the terrorism and situational awareness features, including *Watchline*. This group released sixteen articles about terrorism-related activity both domestically and abroad. These articles averaged 184 views over a seven-day period.

b.   2016 Second Quarter Data

From April 1 to June 30, the total number of visits for the second quarter (Q2) was 58,908. There were seventy-six feature stories that included terrorism-related information, medical response considerations, training information, and internal intelligence relating to operations and situational awareness. There were 19,610 total views for a seven-day period. Dividing the total views by 76 features equals an average of 258 views per feature. As in the first quarter, there was no metric for unique views. The CTDP published twenty-one featured articles about terrorism-related activity both domestically and abroad. These articles averaged 160 views over a seven-day period. The metrics once again stopped after seven days.

2.   DiamondPlate Data Analysis

When looking at the number of views per story over a seven-day span, one could infer that information presented on DiamondPlate is failing to reach field personnel. It appears that both fire and EMS personnel are not getting essential information in a timely manner. It is worthwhile to analyze the total number of visits for Q1 and Q2. The cumulative number of visits for Q1 and Q2 is 71,721 and 58,908, respectively. There was an approximate 18-percent drop in the total number of visits between Q1 and Q2 in 2016. Over a 90-day period, that is an average of approximately 797 visits per day for Q1 and approximately 655 visits per day for Q2. These visits to DiamondPlate do not necessarily mean that *Watchline* is seen. A user has to navigate through DiamondPlate to find *Watchline*.

Other factors could impact several DiamondPlate metrics. It is a cultural practice that many front-line officers use the computer kiosk, rather than office computers, at least twice a day to enter an electronic riding list. If an officer opens the web browser at the kiosk to enter the riding list, it counts as one visit. With over 420 fire units within the FDNY, it is possible that the majority of visits are due to riding list entries. With one officer per unit entering a riding list twice per day over the course of one quarter, or 90 days, there is the potential for over 75,600 visits to DiamondPlate just for riding list entries. One can infer from the data that a high percentage of visits to DiamondPlate may be coming from riding list entries.

The *views* metric helps gauge how well each story reaches the outer edge of the workforce. For Q1, there was an average of 247 views per feature. Without the EMS protocol article, the average view per feature drops to 217 out of almost 14,000 FDNY fire and EMS personnel. Notably, there is no metric for unique views. For example, if a user leaves a particular story of interest (one view) due to a call, reopening the browser later to return to the feature counts as another visit and view. This suggests that there may be an even greater lack of dissemination among members. The average views of featured stories in Q2 suggest the same condition.

Assessing the effectiveness of *Watchline* internal distribution is important to all front-line members. The material provided in *Watchline* is designed to enhance the overall situational awareness of all fire and EMS personnel. Data from the first two quarters of 2016 show that *Watchline* garners fewer than 200 views per week internally. This is only a small fraction of the 40,000 readers highlighted back in 2011.[45] Notably, this statistic does not necessarily capture true internal readership. *Watchline* is sent via email to each fire company and at times is printed and posted in the common area of the firehouse. There is no FDNY policy or requirement to post this one-page intelligence product. All EMS battalions and stations are on the email distribution list, so it is possible that a hard copy is posted in these stations as well.

F. GIS TECHNOLOGY AND ITS USE IN THE FIRE SERVICE

Kenneth Foote and Margaret Lynch from the University of Colorado at Boulder recognize the importance of GIS to make better-informed decisions. Foote and Lynch describe GIS as "a special-purpose digital database in which a common spatial coordinate system is the primary means of reference."[46] Better decisions come from the capability of GIS to enter, store, and analyze selected data. According to Foote and Lynch, the GIS data process has to reflect the function for specific research for a specific task.[47] GIS already aids senior leaders of the FDNY when they are making important strategic decisions regarding building inspections, coordination with local organizations such as the Department of Buildings and the Department of Environmental Protection, and logistical planning. Although GIS technology is already a part of FDNY culture, its capabilities remain in an infancy stage. The department could utilize GIS technology in other ways to benefit the safety of FDNY members and the citizens of New York.

After recognizing the value of GIS technology, the FDNY started its own GIS Unit. The department uses GIS technology to map incidents around the city. The department uses ArcGIS Viewer for Flex for its Critical Response Infrastructure

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[45] FDNY, *Counterterrorism and Risk Management Strategy*, 9.

[46] Kenneth E. Foote and Margaret Lynch, "The Geographer's Craft Project," University of Colorado at Boulder, accessed December 19, 2016, http://www.colorado.edu/geography/gcraft/notes/intro/intro.html.

[47] Ibid.

Management System (CRIMS)'s web-mapping application. In the "Counterterrorism and Risk Management Strategy," the FDNY describes CRIMS as "a secure, web-based, data management tool used to assist on-scene fire chiefs in evaluating critical infrastructure for situational awareness and risk assessment. CRIMS links data together on building construction, storage of hazardous material, in-building communication systems and digital blueprints of floor areas."[48] The FDNY's GIS program has valuable data already stored on its database. Adding terrorism-related information for situational awareness to the GIS database can improve information sharing within the FDNY.

The FDNY uses GIS software to collect different types of data to aid the department in understanding some of its greatest needs. This data is added as different layers to make each item easily identifiable. The FDNY's GIS Unit uses the technology to plot locations of fire hydrants as well as to identify all frozen hydrants in the city. This data provides the FDNY's Thawing Unit important information when deciding which critical areas to service first. The FDNY also uses GIS to map potential radioactive anomalies during the department's annual radiological readings procedure. Radiological readings are taken from every firehouse during the first week in May and plotted in CRIMS to give a full radiological picture of the city. The readings allow senior leaders to make decisions in the event a radiological plume bears down on the city. Current GIS technology can embed pictures and portable document format (PDF) files into any point dropped on the map. Leaders monitoring CRIMS receive a live picture of what is going on at a particular incident.

Other fire departments around the country are using GIS for a number of other purposes. GIS technology has enabled the Seminole Volunteer Fire Department in Virginia to respond to emergencies "faster, safer and more prepared."[49] In April 2007, this department implemented a GIS touchscreen system to its mobile computers. In 2010, the Baltimore Fire Department and the City of Baltimore were in a budgetary crisis and began using GIS technology to ensure proper response times were met after particular

[48] FDNY, *Counterterrorism and Risk Management Strategy*.

[49] "Virginia Fire Department Uses Mobile GIS Technology to Help Incident Responses," YouTube Video, 2:37, posted by "group1ted's channel," November 1, 2008, https://www.youtube.com/watch?v=ezETf1Gj8C4.

fire stations closed.[50] GIS technology is slowly being implemented in a variety of homeland security enterprises.

Like most organizations, the FDNY has a tremendous amount of information to share with its workforce. Much of this information could enhance the situational awareness of all department members. Due to a variety of evolving threats within the homeland, no information may be more critical to disclose to members than suspicious activity—especially from incidents experienced by FDNY members.

Current FDNY GIS technology could provide an engaging platform for members to push and pull information to and from the department. The images in Figure 2 represents an output of the FDNY's GIS technology. This tool allows for important information to reach front-line members of the department. In theory, a unit within the FDNY would report suspicious activity or information impacting future operations and send that information to the GIS Unit. The GIS Unit could then share this information by pinning the incident on the map and including a PDF of the report and any images.

Figure 2. GIS Technology[51]

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50 "Baltimore City (MD) Fire Department Uses GIS Technology to Optimize Resources," Fire Engineering, September 20, 2011, http://www.fireengineering.com/articles/2011/09/baltimore-esri.html.

51 Source: "Crime Mapping," ecoSpatial Research Technologies, accessed December 19, 2016, http://www.ecospatialgis.com/.

G.   DOCTRINAL ISSUES

Many articles about situational awareness have been published by the FDNY on DiamondPlate to educate firefighters and medical personnel. Much of the content within this literature is tactical. It provides instructions for fire and medical personnel on how to handle particular emergencies. Although there is a wealth of information the FDNY gives its members to properly mitigate various incidents, there is little sharing across the organization that improves situational awareness, and thus safety, in the process. Very few FDNY publications discuss situational awareness. The emergency response plan (ERP) bulletin contains the strongest material meant to heighten members' situational awareness. It includes a list that describes specific types of terrorist surveillance and activity. What becomes evident after reading this bulletin is a communication gap within the FDNY, and between the FDNY and other LE agencies.

1.   Suspicious Activity Reporting

The dissemination of intelligence within the FDNY to raise situational awareness lags behind many standard practices of other departments and the private sector. One tool that most agencies use to share intelligence with one another is known as a suspicious activity report (SAR). According to DHS, "Prompt and detailed reporting of suspicious activities can help prevent violent crimes or terrorist attacks."[52] There are many incidents in which an FDNY unit experiences suspicious activity while in the normal course of action. In these instances, according to the FDNY "Regulations for the Uniformed Force," the officer of the fire company is required to place a phone call to the next two levels of command and fill out an unusual occurrence report.[53] An unusual occurrence report is similar to a SAR, but it is not always used in the same way. LE and the IC use SARs to share suspicious activity that might be related to terrorism or other crimes. FDNY members use an unusual occurrence report to document not only crime or terrorism-related activity but also non crime–related incidents. FDNY regulations require "a letterhead report containing a detailed description of the incident shall be forwarded

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[52] DHS, "Report Suspicious Activity," March 4, 2016, https://www.dhs.gov/how-do-i/report-suspicious-activity.

[53] FDNY, *Regulations: Chapter 30*, 2.

through the chain of command to the Chief of Operations."[54] This process takes a hard copy of a letter containing details of the incident and sends it via department messenger vehicle to the appropriate level of command. Not only does this sequence of events take an inordinate amount of time, it is also an example of the silo of vertical intelligence dissemination that exists within the department. The FDNY can improve on current dissemination processes in order to be more efficient and effective.

2.   Strategy for Terrorism and Disaster Preparedness

The department recognizes the more significant role it plays in the IC but has yet to fully capitalize on its detection and deterrence capabilities. In 2007, the FDNY released its *Terrorism and Disaster Preparedness Strategy* to address the following challenges: terrorist threats, natural disasters, organizational adaptability, prevention and protection, planning, training, and coordination and collaboration. Within the prevention and protection section of the strategy, the department discusses its role in the information-sharing environment. The 2007 strategy reads, "In reaction to information gathered and based on the type of intelligence received, the FDNY can increase inspection activity to assist in detection or strategically locate additional resources to act as a terrorism deterrent."[55] While the FDNY can increase its activity, its detection and deterrence capabilities rely mostly on access obtained through its building inspection program and emergency responses.

Within the 2007 *Terrorism and Disaster Preparedness Strategy*, the department describes an ongoing relationship with DHS that improves intelligence sharing between the two organizations. Very little of this information sharing makes its way to field EMS and fire personnel. As described in the strategy, "The FDNY … is working with the DHS Office of Intelligence and Analysis (OIA) to establish a direct information conduit between the FDNY and DHS. By sharing pre-incident intelligence, field observation reports and real-time incident updates, this two-way exchange of information will

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[54] Ibid., 6.

[55] Michael R. Bloomberg, Nicholas Scoppetta, and Salvatore J. Cassano, *Terrorism and Disaster Preparedness Strategy* (New York: FDYN, 2007), 20, http://www.nyc.gov/html/fdny/pdf/events/2007/tdps/terrorism%20strategy_complete.pdf.

enhance both the FDNY's and the nation's preparedness efforts."[56] This relationship provides a great framework to build an enhanced inter-agency intelligence-sharing network. While information sharing between the FDNY and DHS is discussed in the 2007 strategy, there are a couple of issues that currently affect this strategy. The first issue is the absence of dissemination of information to front-line members. If DHS I&A currently shares intelligence with the FDNY, front-line members are not seeing it. The other issue is the lack of horizontal dissemination of intelligence within the FDNY, and certainly to outside agencies as well. Although front-line members encounter suspicious behavior, there is no doctrine that describes how to share this intelligence with I&A.

The FDNY recognizes the need to increase terrorism-prevention efforts by focusing on the intelligence collection capabilities of the department. As a result of 9/11, the 2007 strategy emphasizes, "Terrorism prevention is a role of the FDNY that needs to develop and grow."[57] To date, the FDNY has not published any follow-on documents that clearly educate front-line members about intelligence collection and dissemination procedures. The lack of FDNY information-sharing protocol doctrine demonstrates that the intelligence gaps leading up to 9/11 still exist today. The FDNY suggests, "The department could help fill some of these gaps by contributing to local intelligence-gathering efforts. When routinely shared with intelligence and law enforcement agencies, the information gathered by the FDNY personnel could make a significant contribution to existing intelligence and lead to the identification and disruption of terrorist activities."[58] While the department has made efforts to increase its role in intelligence gathering, it struggles to disseminate this information to outside agencies and, most importantly, to the outer edge of the workforce.

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[56] Ibid.

[57] Ibid.

[58] Ibid.

H. COMMUNICATION AND INTELLIGENCE SHARING

Improving communication and intelligence sharing within the FDNY continues to be a main priority for senior leadership. In 2015, FDNY Commissioner Nigro testified before the U.S. House of Representatives Committee on Homeland Security about confronting challenges in a post-9/11 world. This public testimony included improvements the FDNY has made in communications and intelligence sharing. The commissioner also discussed the importance of homeland security funding and how the department depends on that funding to continue to rebuild into a bigger and better asset to homeland security.

Communication is a vital component of successful operations at any incident. According to the commissioner, "The department has successfully deployed a three-part field communications system that represents a critical step in improved fire-ground communications."[59] This field communication system is meant to thrive in the department's new emergency operations center (EOC) that was purchased with federal funding. The commissioner notes, "One of the elements in this system is the concept of a Networked Command: Linking on-scene situational awareness capabilities with command and control level operations at the EOC."[60] These initiatives to connect field situational awareness with command-level personnel appear to be the major communications point in the testimony. The testimony does not discuss if or how the command-level of the FDNY ensures that the front-line situational awareness they receive at the EOC horizontally spreads to other front-line members at the scene. This situation is similar to the current intelligence-sharing framework within the FDNY.

According to Nigro, the FDNY's CTDP has "become an active producer of intelligence tailored to meet the needs of firefighters and emergency responders."[61] This intelligence comes through *Watchline* and provides valuable information to fire and EMS

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[59] "Confronting Terror Challenges in a Post 9/11 World," testimony of FDNY Commissioner Daniel A. Nigro before the U.S. House of Representatives Committee on Homeland Security, September 8, 2015, http://docs.house.gov/meetings/HM/HM00/20150908/103859/HHRG-114-HM00-Wstate-NigroD-20150908.pdf.

[60] Ibid.

[61] Ibid.

personnel to heighten their situational awareness. Based on the testimony of Commissioner Nigro, the FDNY uses only DiamondPlate to deliver this critical information to its workforce.[62] The FDNY is not capturing its wider audience because of its reliance on DiamondPlate to share this intelligence.

I.   CONCLUSION

While the FDNY has taken many steps to rebuild after the events of 9/11, internal information sharing and external intelligence sharing still need improvement. Although coordination at inter-agency incidents has improved, information sharing between the FDNY and the NYPD remains sparse. NYPD intelligence that could impact FDNY operations remains unshared. Internal information that could enhance the situational awareness of members is often placed in silos and not horizontally disseminated in an appropriate fashion. The department can close its intelligence loop by pulling information from the outer edge of the workforce. SAR integration and training has still not taken place within the FDNY. The DiamondPlate intranet platform is only used to push information. The department could benefit from using the virtual platform to pull information from personnel.

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[62] Ibid.

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III. FDNY FIELD PERSONNEL INSIGHT

Improving internal information sharing is essential if the FDNY wants to move forward with its role not only as an intelligence gatherer, but as a user of intelligence. Before the department proceeds with inter-agency intelligence sharing, it needs to refine the way it collects and analyzes its own information. Field personnel have information that could potentially save the lives of other members of the department. Without an efficient way to share these experiences, members' situational awareness is degraded. This chapter highlights internal information-sharing gaps existing in the FDNY. By analyzing the responses to an internal FDNY survey, the department can formulate the most effective way to share this type of information going forward.

A. FDNY SURVEY

FDNY Battalion Chief Thomas Robson developed and oversees the FDNY terrorism awareness program to enhance the situational awareness of all FDNY personnel. A survey was administered between January 2014 and January 2015 to 500 FDNY fire and EMS personnel who took the terrorism awareness class. Chief Robson has given permission for the data from the survey to be used in this thesis. The ten-question survey was administered to 500 FDNY terrorism awareness students. Questions from the survey were used to assess the following from FDNY members: usage of DiamondPlate, mobile technology acceptance—including apps and social media—readership of *Watchline*, and how department information is obtained while off duty. The anonymous survey responses do not contain any personally identifiable information. Students included both fire and EMS personnel with a variety of experience and years with the department. Analysis of this survey highlights potential information-sharing and intelligence gaps that currently exist within the FDNY.

1. Survey Results

Members were asked whether they used the FDNY DiamondPlate platform and, if so, the frequency of their use. The results were as follows: 256 out of 500 members (approximately 51 percent) used DiamondPlate. The frequency of use varied among

members. Seventy-eight members (approximately 30 percent) visited DiamondPlate once a tour. One hundred and two members (approximately 40 percent) visited DiamondPlate once a week. Fifty-three members (approximately 21 percent) visited DiamondPlate twice a week. Twenty-three members (approximately 9 percent) visited DiamondPlate once a month. Members were asked whether they knew about *Watchline* and, if so, whether they read it. The results were as follows: One hundred and fifty-three out of 500 members (approximately 30 percent) did not know about *Watchline*. An additional fifty-one members knew about *Watchline* but did not read it. Therefore, 204/500 members (approximately 40 percent) did not read *Watchline*.

Members were asked whether they thought learning about suspicious activities was relevant to their jobs. The results were as follows: 498 out of 500 (approximately 99 percent) felt learning about suspicious activities was relevant to their jobs. Members were asked whether they use apps on their smartphones and whether they would be interested in learning about suspicious activity via a smartphone app. The results were as follows: 469 out of 500 (approximately 93 percent) used apps on their smartphones. Four-hundred and twenty-three out of 500 (approximately 85 percent) expressed wanting to learn of suspicious activity via an app. Members were asked whether they already used any informational apps that share department events and news. The results were as follows: 316 out of 500 (approximately 63 percent) used NYC FireWire,[63] GroupMe, or Twitter to learn of department activity or news.

2. Analysis

Five hundred surveys were used to glean information from front-line fire and EMS personnel to identify potential information-sharing gaps within the department. The author of this research recognizes this amount is only a small sample of the FDNY organization. The results of this survey suggest that only half of the members surveyed actually use DiamondPlate. DiamondPlate is the only technology that the department uses

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[63] NYC FireWire is a Facebook page that informs followers of FDNY emergencies and newsworthy events going on around New York City. An FDNY member manages the page, but the content on the page is not affiliated with or controlled by the FDNY.

to share intelligence and information with its members. This creates a potential information-sharing gap within the FDNY.

There are a few reasons for low DiamondPlate usage. First, members do not have access to this platform while off duty. Firefighter access is limited to the time on duty and physically inside the firehouse. Another possible reason is, even if time permits, there is only one computer kiosk in each firehouse. This lone workstation is insufficient for accommodating four to ten firefighters working a given shift. Time spent away from the firehouse while on duty is another cause for poor viewership. Fire companies are engaged in inspection activities that severely limit access to the DiamondPlate kiosk in the firehouse. In 2007, after the tragic Deutsche Bank building fire, the department added a third day of building inspection to the workweek. This extra day makes for a total of nine hours of building inspections per week. Hydrant inspections take place twice a week for a total of six hours. Random complaints that require inspections are not factored into any of these estimates but can add hours in excess of those already counted.

Another daily activity that keeps members away from DiamondPlate information is training. The department maintains a very rigorous training schedule to ensure all members are up to date on the latest procedures and mitigation techniques for a variety of emergencies. Six days a week there is a daily training schedule that is released to field companies. Units are assigned to specific training that can include any one of the following: ropes and personal safety system (PSS),[64] motor vehicle extrication, search and rescue, emergency self-contained breathing apparatus procedures, and fire scenarios, among others. Depending on the assigned training, fire companies are required to drive apparatuses to the fire academy or other designated training locations throughout the city. This travel time detracts from any possible professional development that DiamondPlate

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[64] The PSS is a rope-and-hook anchoring system that is attached to a firefighter's personal harness. Members can use this system as a last resort in the event they must bail out of a burning building. This system came into operation as a result of the Black Sunday fire that occurred on January 23, 2005. Six firefighters were forced to jump out of the fourth-floor window while operating above the fire. FDNY Lieutenant Curtis Meyran, the covering officer of Ladder Company 27, and Ladder 27 Chauffeur Firefighter John Bellew died as a result of their injuries. Lt. Joseph DiBernardo passed away in 2011 as a result of injuries sustained from fighting the Black Sunday fire.

has to offer. In addition to these factors, fire and EMS personnel never receive training on how to appropriately use the computer kiosk and the DiamondPlate platform.

Unfortunately, EMS personnel have even less access to DiamondPlate information. Although the EMS schedule has members working more days per week than firefighters (five days on and two days off, versus two twenty-four-hour shifts), their work life is not conducive to DiamondPlate access. These members spend almost their entire shifts on ambulances at specific city intersections. While on the ambulance, EMS personnel have no access to DiamondPlate, which inhibits their professional development. For the brief time they spend in the EMS station, there is only one computer kiosk for approximately twenty EMS workers. Perhaps the limited DiamondPlate access has caused a lack of buy-in within EMS culture.

Watchline is the only traditional intelligence product that is published for all FDNY personnel. Approximately 70 percent of those surveyed knew about *Watchline*. However, it is interesting that there was a ten-percent drop between quarters in the amount of people actually reading *Watchline*. It is possible limited access to the product is causing the 40-percent lack of readership among front-line members. Another potential reason for lack of internal readership is that *Watchline* is not a real-time intelligence product.

FDNY members are often placed in harm's way. It is this type of experience that could have produced the overwhelming number of those surveyed (approximately 99 percent) to feel that learning about suspicious activity is relevant to their jobs. The vast majority (approximately 93 percent) of those surveyed use apps on their smartphones. Approximately 85 percent would like to learn about suspicious activities via a smartphone app. Perhaps using this type of technology might allow for better dissemination of suspicious activity, which in turn could enhance the overall situational awareness of FDNY personnel.

Approximately 63 percent of survey participants already use some type of mobile app to glean department-related information. The department uses two Twitter accounts to share information. @FDNY is used to share public information and safety tips and

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@FDNYalerts is a notification feed from FDNY operations. This account, however, is automated, not monitored. Information posted to @FDNYalerts is limited and only pertains to fires or major emergencies going on around the city. If the department can expand the sharing of information with members using these types of apps, members potentially have a better chance of going home safely. While the DiamondPlate data shows infrequent use by the workforce, at least 70 percent of those surveyed use DiamondPlate at least once per week.

The FDNY can improve on its intelligence and information-sharing processes. While DiamondPlate offers some of the best training and situational awareness content the department has to offer, it appears that much of that knowledge does not reach front-line personnel. Utilizing mobile applications could lead to an improved information-sharing platform within the FDNY.

B.   CONCLUSION

The manner in which the department is sharing information needs improvement. The survey data supports the need for improving situational awareness information and intelligence dissemination within the FDNY. While DiamondPlate continues its dominance as the information-sharing hub of the FDNY, alternative means are necessary to reach all members of the department. Members are concerned they are not receiving critical situational awareness information that could potentially save their lives. There is current technology in place to help the organization with such an endeavor. The greatest challenge now is how one of the biggest fire departments in the country can adopt change while avoiding many of the organizational change barriers that lie ahead. Perhaps acknowledging the barriers and their impact on the FDNY can aid positive change. This could allow the FDNY to build a lasting framework that improves intelligence dissemination to all members. FDNY intelligence collection and dissemination have taken steps forward since 9/11. While this progress is encouraging, recent terrorist plots in New York City and surrounding areas support the need for further intelligence

development within the FDNY.[65] With proper training, the access provided to FDNY members can provide enhanced human intelligence to LE and IC. By sharing all properly vetted suspicious activity the FDNY encounters, LE and the IC can get a better picture of what is actually going on in the city.

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[65] Emanuella Grinberg et al., "NY, NJ Bombings: Suspect Charged with Attempted Murder of Officers," CNN, September 19, 2016, http://www.cnn.com/2016/09/19/us/new-york-explosion-investigation/.

IV. ORGANIZATIONAL CHANGE THEORIES AND BARRIERS

There is vast amount of research on organizational change, and yet companies continue to struggle to successfully implement the modifications they seek. Like many agencies, organizational change does not come easily for the FDNY. The department has had its own successes and failures when trying to make alterations. According to Rick Maurer, estimates show any type of organizational change has a 70 percent failure rate.[66] Studying an organization like the FDNY can reveal many possibilities for why changes are so difficult to implement. Work by Harold J. Leavitt, Joseph Mosca and Stuart Rosenberg, and other organizational change scholars provides insight into what types of change barriers exist and how to avoid their pitfalls. This chapter analyzes organizational change barriers that potentially restrain the FDNY from adopting new communication technologies.

A. ORGANIZATIONAL CHANGE THEORIES

Mosca and Rosenberg from Monmouth University have studied specific barriers to organizational change. While scholars agree on the level of organizational change failure, they do not agree on its causes.[67] After conducting an exhaustive study of organizational resistance to change, Mosca and Rosenberg compiled the following top-twenty impediments:

1. Employees' attitudes/disposition toward change

2. Fear of the unknown (uncertainty)

3. Lack of understanding of the firm's intentions

4. Fear of failure

5. Disruption of routine

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[66] Rick Maurer, "Applying What We've Learned about Change," *Journal for Quality and Participation* 33, no. 2 (July 2010): 35.

[67] Joseph Mosca and Stuart Rosenberg, "Breaking Down the Barriers to Organizational Change," *International Journal of Management and Information Systems* 15, no. 3 (2011): 139, doi: 10.19030/ijmis.v15i3.4650.

6. Increased workload (due to downsizing or employees leaving voluntarily/involuntarily)

7. Lack of rewards for implementing change

8. Perceived loss of control, security, or status

9. Poor leadership

10. Dysfunctional organizational culture

11. Organizational size and rigidity

12. Lack of management support for the change (organizational commitment)

13. Lack of trust between management and employees

14. Inability or unwillingness of management to deal with resistance

15. Lack of participation due to top-down steering

16. Organizational politics/conflict

17. Internal conflict for resources

18. Lack of consequences for inadequate or poor performance

19. The content of the change (an ill-conceived change/relevance of the goals of change)

20. Poor implementation planning[68]

Mosca and Rosenberg break these factors into three groups. Items one through eight represent personal factors as barriers to change, nine through eighteen make up organizational issues negatively affecting change, and factors nineteen and twenty are problems with the change itself.[69] The authors conclude that management is one of the most powerful resistances to change. Successful implementation cannot happen without managerial support. In many instances, managers will have to adopt whatever organizational change strategies work best for their organization.[70]

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[68] Ibid.

[69] Ibid.

[70] Ibid., 144.

Kenneth Hultman addresses different human behaviors affecting organizational change. In his article, Hultman describes the difference between active and passive resistance. Symptoms of active resistance include manipulating, sabotaging, undermining, and starting rumors. Passive resistance symptoms include when people agree verbally but do not follow through, fail to implement change, or stand idly by and allow change to fail. These types of behaviors express resistance to change but do not explain why the resistance occurs.[71]

Other experts declare that resistance to change stems simply from a defense of the status quo. Ann Gilley, Jerry Gilley, and Marisha Godek compare an organization to the human body to better illustrate resistance to change. These authors believe that organizations, like human bodies, consist of sub-systems and processes functioning in unison to run efficiently. Gilley, Gilley, and Godek suggest, "The healthiest systems are dynamic, capable of recognizing and responding to change in a positive manner."[72] Both human bodies and organizations react similarly when confronted with a systemic change. According to the authors, "An organization's immune system is like the human one, [it] protects against change (foreign objects or ideas) by erecting a powerful barrier in the form of people, policies, procedures, and the culture it creates to prevent change, regardless of the consequences."[73] Both individuals within the organization and the organization itself have immune systems to change. Gilley, Gilley, and Godek suggest two-way communication and employee involvement can disarm the immune system by keeping all members informed and involved in the change.[74]

Just as some scholars highlight specific organizational change barriers, others focus on positive behaviors helping organizations to implement change. Rosabeth Moss Kanter, Barry A. Stein, and Todd D. Jick present ten commandments for executing change:

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[71] Kenneth E. Hultman, "Scaling the Wall of Resistance," *Training and Development* 49, no. 10 (October 199): 15.

[72] Ann Gilley, Jerry W. Gilley, and Marisha Godek, "Change, Resistance, and the Organizational Immune System," *SAM Advanced Management Journal* 74 (September 2009): 5.

[73] Ibid.

[74] Ibid., 9.

1.   Analyze the organization and its need for change.

2.   Create a shared vision and common direction.

3.   Separate from the past.

4.   Create a sense of urgency.

5.   Support a strong leader role.

6.   Line up political sponsorship.

7.   Craft an implementation plan.

8.   Develop enabling structures.

9.   Communicate, involve people and be honest.

10.   Reinforce and institutionalize change.[75]

Commandments three and four are highlighted as critical to successful change. Organizations cannot change without disengaging from their past. When looking to the future, an organization must isolate the structures and routines that no longer work and move clear of them. Organizational change comes more easily when companies are just about to fail.[76] But, according to Kanter, Stein, and Jick, "When the need for action is not generally implicit, a change leader should generate a sense of urgency."[77] These ten commandments provide guidelines for any organizational change practitioner. However, according to Kanter, Stein, and Jick, failure to implement change can come from blatant incompetence, mismanagement, or even ignorance; commandments, after all, can be ignored or broken.[78]

B.   LEAVITT'S DIAMOND

Harold J. Leavitt produced a model using distinct sets of approaches to organizational change. This model became known as Leavitt's Diamond, a popular change-management framework. Scholarly articles often reference this framework when

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[75] Todd D. Jick, Rosabeth Moss Kanter, and Barry A. Stein, *The Challenge of Organizational Change* (New York: The Free Press, 1992), 383.

[76] Ibid., 375, 383.

[77] Ibid.

[78] Ibid., 386.

discussing organizational change. Leavitt's work views organizations as complex systems consisting of the following interacting variables: tasks, structure, technology, and people.[79] Leavitt's inclusion of technological change makes a fitting theory for this thesis.

Each variable is defined in order to illuminate each specific change approach. *Tasks/policy and process* includes worker production as well as the various subtasks that exist in complex organizations.[80] *People* refers to the workforce of an organization including members of management. *Technology* refers to digital problem-solving inventions like computers. *Structure* is defined as a system of communication and workflow.[81] Figure 3 depicts the interdependent variables of Leavitt's Diamond.
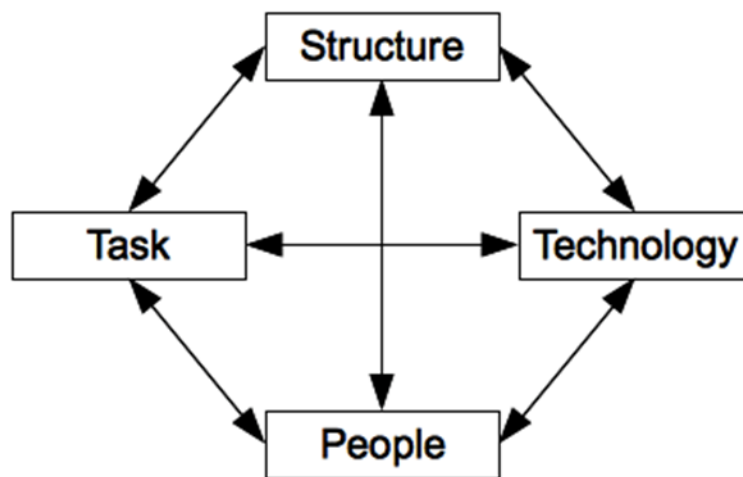
Figure 3. Leavitt's Diamond[82]

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[79] Harold J. Leavitt, "Applied Organizational Change in Industry: Structural, Technological and Humanistic Approaches," in *Handbook of Organizations*, ed. James G. March, 1144–1170 (Skokie, IL: Rand McNally, 1965), 1144.

[80] Leavitt's Diamond originally used tasks to describe the actions of workers. Numerous studies have adapted this to include policy and processes.

[81] Leavitt, "Applied Organizational Change in Industry," 1144.

[82] Source: Ibid., 1145.

Leavitt posits, "These four are highly interdependent … so that a change in any one usually results in a compensatory (or retaliatory) change in the others."[83] For example, Leavitt explains the introduction of a new technological tool, such as a computer, may positively or negatively affect the three other variables of the diamond. The introduction of a computer introduces changes to the system of communication (structure); the number of people, their skills, and activities (people); and performance (task), since some tasks will become achievable for the first time while others will become unnecessary.[84]

C.   SUCCESSFUL AND FAILED CHANGES IN THE FDNY

Over the years, the FDNY has tried to evolve many times. The type of change and other organizational factors such as leadership and managerial support certainly affect the results of department change initiatives. In order to better understand what restrains the FDNY from making necessary changes, some examples of successful and failed changes are analyzed in this section.

1.   2007 FDNY *Terrorism and Disaster Preparedness Strategy*

An implementation of change is bound to fail if an organization does not recognize its own organizational change barriers. The 2007 *Terrorism and Disaster Preparedness Strategy* included a section on FDNY intelligence practices. This section discussed changing the FDNY's role in terrorism prevention and information sharing. The department discussed various ways personnel could gather terrorism-related information through routine building inspections, arson investigations, and medical calls.[85] What is missing in the FDNY strategy is a gap that still remains some nine years later: there is still no clear process on how to gather this type of information, nor how to share it. Current processes have potential terrorism-related information treated in the same manner as other non crime–related reports.

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[83] Ibid.

[84] Ibid.

[85] Bloomberg, Scoppetta, and Salvatore, *Terrorism and Disaster Preparedness Strategy*.

The intelligence section of the 2007 FDNY strategy is a failed change. Mosca and Rosenberg highlight poor implementation planning as a barrier to organizational change. This barrier is specific to the change itself.[86] While the FDNY had implemented a new strategy to contribute more to LE and the IC, its implementation process was not effective. How can the FDNY share information with others effectively if the department does not share appropriately within itself? A proper strategy to change the way FDNY information is shared within the department is necessary. This will allow for better external communication with LE and the IC.

According to Mosca and Rosenberg, the attitudes and dispositions of FDNY personnel are a potential barrier to change.[87] It is reasonable to believe most firefighters and EMS personnel did not take their respective jobs to do intelligence work. Because these services are well respected by the public, a firefighter or EMT may feel that changing his or her role violates the trust between the responder and the citizen. This disposition among the workforce is not conducive to successful change.

Leavitt's theory suggests the FDNY changed the tasks of its members when it asked them to work as intelligence gatherers. The department never changed the structure, the way this information is shared, the people collecting the intelligence, nor the technology to allow for efficient collection and dissemination. Leavitt states these variables must change in order for the initial change to have a lasting effect.

2.   FDNY Suspicious Activity Reporting Program

In October of 2011, graduate student Captain Christopher P. Ward wrote a policy memo on developing a SAR program for the FDNY. Captain Ward's memo acknowledged communication areas within the FDNY needing improvement. Specifically, the information-sharing process within the FDNY at that time was stovepiping. One of the most forward-thinking recommendations in this policy memo is the addition of a SAR page on DiamondPlate to allow members the freedom to report

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[86] Mosca and Rosenberg, "Breaking Down Barriers," 140.

[87] Ibid., 141.

suspicious activity at their own will.[88] To date, no such SAR program exists in the FDNY. Gilley, Gilley, and Godek suggest a proposed change can trigger an organizational immune system response to defend the status quo.[89] Captain Ward's proposal was like an invasive germ in the organization's system. According to Leavitt's Diamond, developing an FDNY SAR program should have been successful. Changing the way terrorism-related information was shared affected the structure variable. Allowing any member to report suspicious activity changed the people variable. Adding a page to DiamondPlate changed the technology. Having members report suspicious activity through DiamondPlate changed the tasks variable. While it appears Leavitt's Diamond was properly applied, this change still failed. Other barriers highlighted in this chapter negatively affected this change initiative. Mosca and Rosenberg suggest a lack of managerial support can prevent the change from taking place.[90]

There is certainly controversy when discussing the role of first responders and intelligence collection. For years, the American Civil Liberties Union (ACLU) has raised questions regarding a firefighter's role as an intelligence gatherer. According to Mike German, who served as the policy counsel for national security and privacy for the ACLU, the intent of a SAR program within the fire service is to turn firefighters into legally protected domestic spies.[91] Shortly after the Los Angeles Police Department created its own SAR program, the ACLU released a report criticizing the program and others like it.[92] According to Mosca and Rosenberg, this controversy makes it more difficult for FDNY senior leadership to support changing the role of first responders and developing an FDNY SAR program. In addition, losing the public's trust affects the status of the FDNY, and is thus a barrier to implementing change.

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[88] FDNY Captain Chris Ward graduated from the Naval Postgraduate School in 2014. He granted permission to use his policy memo in this thesis.

[89] Gilley, Gilley, and Godek, "Change, Resistance, and the Organizational Immune System," 4.

[90] Mosca and Rosenberg, "Breaking Down Barriers," 141.

[91] David Edwards and Muriel Kane, "Firefighters Asked to Report People Who Express Discontent with the Government," Raw Story, November 29, 2007, http://www.rawstory.com/news/2007/Homeland_Security_turns_firefighters_into_domestic_1129.html.

[92] "More about Suspicious Activity Reporting," American Civil Liberties Union, accessed December 14, 2016, https://www.aclu.org/other/more-about-suspicious-activity-reporting.

3.   Emergency Action Message

In 2010, Battalion Chief Thomas J. Richardson described an FDNY policy to disseminate information to responders in the field via an Emergency Action Message (EAM). This digital message was designed to provide front-line members with unclassified information to enhance their situational awareness. This new FDNY policy chose email as the method of delivery for all EAMs. Units out of quarters would have received notification via the apparatus mobile data terminal that a new EAM was waiting in the fire company's email account.[93] While this recommended communication change was innovative at the time, it was never accepted as FDNY practice.

Many organizational change studies suggest there are several reasons why a change like this could have failed. The fact the EAM was a drafted policy means many of the organizational change barriers described by Mosca and Rosenberg were avoided. When getting this close to successful change, personal barriers do not apply. Resistance in any of Mosca and Rosenberg's eight personal factors could not allow a drafted policy to make its way to senior leadership. Organizational barriers and change practices themselves are the only resistance to impede EAM implementation. In a bureaucracy, it is certainly believable that organizational politics are a barrier to change. It is possible by the time the EAM policy was ready for implementation, senior leadership no longer supported the project.

The EAM project failed to follow Leavitt's model because the FDNY implemented a new system of communication to share information that affected the structure variable but did not account for other variables in the diamond. In this instance, the new method of communication, the EAM, relied on email as the technology to disseminate information. There was a dependence on technology already in place. There were no policy guidelines sent to members to explain their new tasks at work to receive the EAM. Perhaps the number of people working on the project was insufficient to help create successful change. This attempted change was not the only instance in which an innovative idea for the FDNY failed to take hold.

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[93] Richardson, "Identifying Best Practices," 71.

4. DiamondPlate Implementation

Although many innovative change initiatives have failed in the FDNY, there are a few that have been implemented successfully. The creation of DiamondPlate is one example of a successful change. Diamond Plate is a web-based training and situational awareness tool that changed the way the department disseminated information to its members. The FDNY lost an immense amount of experience and expertise after 9/11.[94] This type of knowledge is not easily replaced. DiamondPlate was borne out of a need to preserve the collective knowledge that the FDNY builds on every day.[95] Through proper planning and grant funding, DiamondPlate continues on as the only digital information-sharing platform between the FDNY and its members.

Successful DiamondPlate implementation could provide a roadmap for changing the way the department communicates with its members. According to Leavitt's Diamond, DiamondPlate was successfully implemented because the three other interdependent variables changed. The project charter for DiamondPlate included the requirement for the technology to deliver a broad range of information to members in the field quickly and efficiently.[96] Front-line members chosen by bureau heads worked with technical support staff to produce content based on their subject-matter expertise. A new technology, Adobe Creation, was introduced to writers and publishers of DiamondPlate content.

Multiple groups consisting of both uniformed and non-uniformed personnel worked seamlessly to get DiamondPlate up and running. These groups included FDNY Operations, the Bureau of Technology Development and Systems, the Bureau of Training, and the CTDP, among many others.[97] Overhauling the manner in which the department communicated with its members was certainly an invasive change. Gilley, Gilley, and Godek suggest the department's two-way communication and employee involvement throughout the change could disarm its immune system. By keeping

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[94] Dowling and Spadafora, "FDNY DiamondPlate," 30.

[95] Ibid.

[96] Ibid.

[97] Ibid.

members informed and providing participants with a voice, DiamondPlate saw successful implementation.[98] Although this thesis has questioned the effectiveness of the DiamondPlate platform as an information-sharing tool, it is noteworthy that DiamondPlate managed to successfully navigate through many organizational change barriers.

5. FDNY Rescue Task Force

One of the more recent successful changes in the FDNY is the creation of a rescue task force (RTF). In response to events like the Pulse Nightclub shooting in Orlando, the FDNY created a team of firefighters and EMS personnel to rescue trapped civilians during an active-shooter incident. Other departments introduced the modern concept of a Rescue Task Force years before the FDNY.[99] Although the FDNY is one of the largest departments in the country, the current threat environment pushed the FDNY to rethink active-shooter procedures. This change came swiftly, as multiple Rescue Task Forces were staffed around the city during specific holidays and events.[100]

In order to successfully change FDNY procedures, Mosca and Rosenberg suggest senior-level staff chiefs must support the idea and lead the workforce through the transition period. Every variable of Leavitt's Diamond was successfully changed when the tasks of firefighters and EMS personnel were changed. The example shows a thoughtful account for the people variable in Leavitt's Diamond, as the appropriate number of personnel were trained as Rescue Task Force members. Leavitt's structural variable manifested in the special training given to members to communicate with NYPD on the scene, which affected the structure variable. The technology variable was changed with the distribution of new ballistic gear.

[98] Gilley, Gilley, and Godek, "Change, Resistance, and the Organizational Immune System," 9.

[99] David K. Tan, "Rescue Task Force Is Best Medical Response to Active Shooter Incident," EMS1.com, October 8, 2015, https://www.ems1.com/rescue-task-force/articles/13305048-Rescue-Task-Force-is-best-medical-response-to-an-active-shooter-incident/.

[100] Susan Edelman and Kenneth Garger, "City Program Sends Unarmed Firefighters and EMTs into 'Active Shooter' Situations," *New York Post*, October 2, 2016, http://nypost.com/2016/10/02/city-program-sends-unarmed-firefighters-and-emts-into-active-shooter-situations/.

6. Bunker Gear and Personal Safety System

Other successful changes in the FDNY include the introduction of bunker gear to firefighters and the distribution of personal safety systems (PSS) to all fire personnel. Unlike the DiamondPlate implementation, which was proactive, these changes were reactive to specific events. In 1994, FDNY Captain John Drennan, Firefighter Christopher Siedenburg, and Firefighter James Young died while battling a blaze in Manhattan that is now known as the Watts Street fire. According to Chief Dennis Martin of the National Association of Chiefs of Police and Firefighters, "Bunker pants could have minimized the injuries … they are a necessity."[101] At the time, other major cities around the United States had bunker gear as standard issue. Richard M. Duffy, the director of health and safety for the International Association of Firefighters, said that New York was one of the last big cities without bunker gear.[102]

In 2005, five firefighters and one lieutenant were forced to jump out of a five-story window. Three FDNY members died as a result of this tragedy. The other three survived but sustained life-altering injuries.[103] Similar to the tragic events of the Watt Street fire, PSS were not distributed to all fire personnel until after the loss of these members. PSS eventually came to members in the field after an extensive piloting program. Members were given PSS from different companies and designs to assess functionality and comfort. Their feedback was given to subject-matter experts and senior leadership on each specific design. Chief of Training for the FDNY Thomas Galvin said, "Whenever the department suffers a fatal fire, we take a constructive, critical look at the event."[104] Using firefighter feedback, the department was able to institute a change that has since saved the lives of several firefighters.

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[101] James Barron, "Giuliani Promises Firefighters New Gear," *New York Times*, March 30, 1994, http://www.nytimes.com/1994/03/30/nyregion/giuliani-promises-firefighters-new-gear.html.

[102] Ibid.

[103] Ginger Adams Otis and Barbara Ross, "Families of FDNY Firefighters Killed or Injured in Black Sunday Blaze in the Bronx Awarded $183 Million," *New York Daily News*, February 22, 2016, http://www.nydailynews.com/new-york/bronx/families-black-sunday-firefighters-awarded-183m-article-1.2540308.

[104] Wil Cruz, "Best for the Bravest, FDNY Starts Doling out Newly Designed Safety Rope, Harness to Firefighters, Eight Months after Tragedy," *New York Newsday, City Edition*, October 5, 2005.

There are certain common threads shared in these examples of positive change. In both the PSS and bunker gear examples, management supported the change. Mosca and Rosenberg assert, "There cannot be any resistance on the part of management in order for the organizational change to be successfully implemented."[105] In an organization the size of the FDNY, it seems that without support of senior-level leaders, any change is doomed to fail. A pilot program for each change is also a shared trait. Gilley, Gilley, and Godek support the idea of implementing change gradually. The authors suggest that people perceive gradual change as more manageable and adjust much better to changes that occur slowly.[106] Research by Mosca and Rosenberg also supports this notion. They explain that incorporating change incrementally allows for diminished risk if the change does not seem to work.[107] The idea of incorporating change slowly and incrementally supports an FDNY piloting program for any change endeavor.

D.   CONCLUSION

Studying examples of both failed and successful FDNY change along with the organizational change theories can help define some of the barriers that prevent the FDNY from further evolving. Without the right execution, any attempt to change something within the FDNY is bound for the abyss. The vast majority of change in the FDNY occurs in a reactive rather than a proactive fashion. Initiatives that failed to change the department include the 2007 FDNY intelligence strategy, the development of an FDNY SAR program, and the implementation of an EAM. The FDNY continues to have some of the organizational change barriers presented in this chapter. Leavitt's framework of changing all four variables did not lead to successful change in the FDNY SAR initiative. The failed examples all share a lack of managerial support as a potential factor for organizational change resistance.

Analyzing the positive FDNY change examples could provide future endeavors with a blueprint for successful implementation. Successful FDNY change initiatives

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[105] Mosca and Rosenberg, "Breaking Down Barriers," 144.

[106] Gilley, Gilley, and Godek, "Change, Resistance, and the Organizational Immune System," 7.

[107] Mosca and Rosenberg, "Breaking Down Barriers," 144.

include changing the way information is shared with members through DiamondPlate technology, the creation of an FDNY Rescue Task Force, and the addition of new safety equipment such as bunker gear and PSS. DiamondPlate proved the department can implement successful changes in a proactive manner. These examples validate Mosca and Rosenberg's theory that managerial support and leadership is needed for successful modifications to take place. All successful examples validate Kanter, Stein, and Jick's theory that it is critical to move away from ineffective past practices to allow for successful change to have effect.

V.   MOBILE TECHNOLOGY TO IMPROVE THE DISSEMINATION OF FDNY THREAT AND SAFETY INFORMATION

The FDNY is not known for groundbreaking technology. In fact, it was not until 2010 that carbon paper was finally retired from use. The department has slowly begun to recognize the need for incorporating technology into the everyday work life of FDNY members. From electronic riding lists to digital files for building inspections, the FDNY is slowly evolving into a more technologically advanced workplace. This chapter explores a concept of operations for an FDNY app to help the FDNY better disseminate information to its members.

A.   FDNY MOBILE APP

Developing an FDNY app could enhance the safety of all department personnel. As DiamondPlate use and survey data suggest, many members in the FDNY remain uninformed. This lack of awareness creates an unsafe condition during responses and inhibits potential information sharing among members. An app helps solve the problem of reaching off-duty members as opposed to only those physically working at a firehouse or EMS station. This type of communication could enhance the situational awareness of members by covering a range of topics. There are several websites and social media pages that piece together some of this information. Having one platform could provide members with a one-stop shop for necessary information. An app can also connect the fire and EMS sides of the FDNY by providing meaningful information that is relevant to both types of personnel. The information on the official FDNY app must be vetted for full transparency and accuracy. Many of the information-sharing sites used by members contain rumors and misinformation.[108] An FDNY app could include the following features in its platform:

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[108] Websites and Facebook pages like NYC FireWire and FDNY Rant provide unofficial department information. While much of the information is useful, there are too many rumors and falsehoods about events that impact their accuracy. Current members access these information-sharing sites especially when off duty with no access to department information.

- GIS

- Fire and emergency response feed

- Pass It On Program

- FDNY procedures

- Department orders

- SARs or unusual occurrences

- *Watchline*

- Watchline Alert

All of these subjects impact the situational awareness of first responders. Figure 4 represents a concept of the FDNY app icon, dubbed "FDNY Mobile." Figure 5 depicts a concept log-in screen to access the app. Figure 6 is the concept home screen for FDNY Mobile with corresponding features.

Figure 4. FDNY Mobile App Icon

Figure 5. FDNY Mobile Login Screen

Figure 6. FDNY Mobile Home Screen[109]

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[109] FDNY Mobile was designed by researching mobile applications in use by the Sacramento Fire Department, the District of Columbia Fire Department, and the Bossier City, Louisiana Fire Department. While these agencies have gone mobile, it appears much of their apps are designed for public use and do not specifically target department personnel as potential users. The mobile applications are scalable to any size organization. The features within the applications are based on the information-sharing requirements of the particular agency.

(1)   GIS

This feature makes the current FDNY GIS technology mobile. Individual fire companies collect a wealth of data while conducting building inspections and responding to emergencies. These data include anything affecting the safety of responders as well as any suspicious behavior or activity witnessed. A mobile GIS feature will connect the experiences of the fire and EMS sides of the FDNY. Currently, these experiences and potential life-saving knowledge are not shared between the groups. Within the GIS feature, each firehouse and EMS station is pinned on the map to provide members with locations of facilities. This is no different than what Google Maps provides in terms of layout. The image in Figure 7 shows a map of local firehouses in Brooklyn, New York, as it would appear in the app.
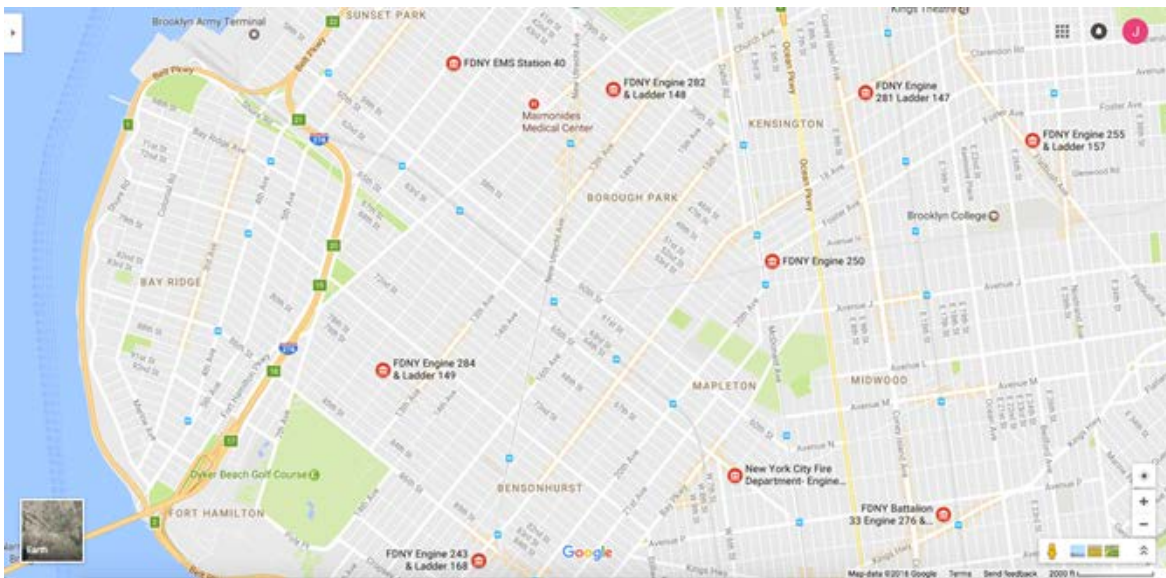
Figure 7.   Map of Firehouses and EMS Stations in Brooklyn, New York[110]

The department needs its own app with accurate, real-time data. According to Google Maps, Engine 247 in Brooklyn is permanently closed, making this inaccuracy unreliable. The images in Figure 8 shows an example of Google Maps data.

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[110] Source: Google Maps, accessed December 31, 2016, https://www.google.com/maps/search/fdny +firehouses/@40.625429,-73.9931312,14.15z.
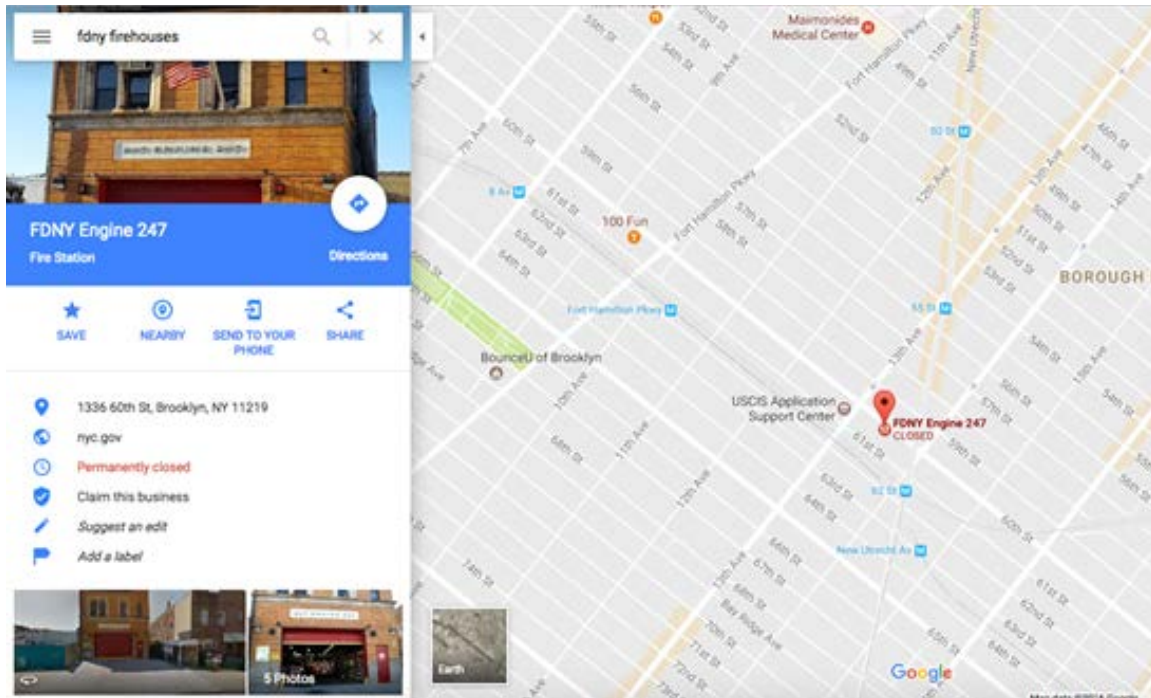
Figure 8. Google Maps Data Showing Engine 247 Permanently Closed[111]

The GIS feature within FDNY Mobile can also store the specific hazard information and SAR activity for each firehouse and EMS battalion. This feature allows firefighters and EMS personnel working a shift in a different area of the city to gain instant access to specific threats and hazards in that area. Relocated units would also benefit from access to this data. Making the GIS feature interactive could allow officers in the field to both pull and push information from and to others when necessary. Instead of going back to the firehouse or EMS station to write a report, the officer can instantly drop a pin on the location where the event took place with particular details to share immediately with other members. Such a feature is useful for sharing hazardous information that does not require additional vetting by fire marshals or LE.

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[111] Source: Google Maps, accessed December 31, 2016, https://www.google.com/maps/place/FDNY+ Engine+247/@40.6281324,73.9998561,17z/data=!3m1!4b1!4m5!3m4!1s0x89c2453a87821155:0x3e19572 00252b261!8m2!3d40.6281283!4d-73.9976674.

(2)   Response Feed

By providing the box number, address, type of occupancy, and—most importantly—the units responding to a call, members could receive a real-time picture of FDNY activity throughout the city. This real-time picture provides members with critical information that could impact operations at the next emergency. The FDNY limits much of the information it shares via its Twitter and Facebook accounts. As cited in the survey analysis in Chapter III, much of the information shared on the department's social media pages is for public safety. Fires and major emergencies are shared, but details include only the address, type of occupancy, and the location of the fire. There are several unofficial websites and mobile messenger apps FDNY members use to obtain more details on department response information. According to the FDNY survey cited in this thesis, approximately 63 percent of members receive information from one of these sites.

(3)   Pass It On Program

The concept of this feature in FDNY Mobile is to build an electronic database for the Pass It On Program. Unfortunately, members do not have these valuable shared experiences in a digital format. This limits the effectiveness of the program as older experiences are often never reviewed. Hard copies of the Pass It On Program notes are stored on a clipboard and kept in the common area of the firehouse with the most recent experiences stacked on top of older submissions. This type of storage leads to ineffective sharing and an uninformed workforce. A Pass It On Program feature in the app could allow for the digital storage of all shared experiences, improving dissemination to all personnel. A digital format of these experiences also provides officers with the ability to search for specific topics to enhance training among members. Digital access to these examples could also provide guidance to on-scene incident commanders encountering a similar type of event for the first time.

(4)   FDNY Procedures

Digital access to FDNY procedures allows for the professional development of firefighter and EMS personnel. The FDNY has thousands of pages of procedures describing mitigation techniques for particular emergencies. Due to evolving threats and

changes to department policy, these procedures are changed quite frequently. This feature could allow members to access the most up-to-date procedures issued by the department. Firefighters study the most commonly used standard operating procedures while in probationary firefighter school. EMS rookies study an operations guide while in the EMS academy. Fire officers from the rank of lieutenant through staff-level chief must have intricate knowledge of these manuals when studying for promotional exams. More importantly, these procedures are designed to keep all firefighters and EMS personnel safe while operating at an emergency. Having a feature in the app to supply all procedures could help ensure responders have all the information necessary for even the rarest of emergencies. A search function within this feature could allow members to search for specific keywords to find the material they need as opposed to having to look through an index or knowing the particular document number.

(5)   Department Orders

Usually released once every few days, the FDNY department orders include comprehensive lists of personnel movements, such as promotions, retirements, and FDNY events, going on around the city. Most importantly, this bulletin highlights any changes to department procedures made by senior leadership. These changes in policy often affect different types of response or inspection activity.

(6)   SARs/Unusual Activity

As cited previously, the FDNY has yet to adopt the nationwide SAR initiative. However, for decades, the department has reported suspicious activity experienced by field personnel. This type of field reporting creates an inductive picture of what is going on around the city. This feature has the potential to become the new push–pull of suspicious activity for the FDNY. The department can pull information from the outer edge of the workforce by allowing members to report suspicious activity via FDNY Mobile. Once the information is vetted, the department can push it out to the workforce, creating horizontal dissemination. Many unusual experiences of fire personnel have relevance in the EMS world and vice versa. This feature could create a new intelligence product for the FDNY by analyzing events happening on the ground. The FDNY app

provides a flow of critical information, thus enhancing the situational awareness of all members of the department.

(7)   *Watchline*

Pushing *Watchline* through FDNY Mobile would allow both on- and off-duty members better access to the department's lone intelligence product. Survey and DiamondPlate usage data suggest that members in the field are interested in learning more about suspicious activity and terrorism-related information.

(8)   Watchline Alert

When critical information must reach members of the FDNY, the department can push it to all personnel through Watchline Alert. This feature would replicate the kind of federal alert that went out following the Chelsea bombing incident in 2016. This type of notification is also used for amber alerts or emergencies such as chemical spills.[112] This alert system would provide members in the field with real-time information, improving the department's information-sharing capabilities. Currently, members must wait for the weekly release of *Watchline* for any type of intelligence. The screen capture in Figure 9 is an example of the alert system on a mobile device.

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[112] "Here's How You Got a Mobile Alert on the Chelsea Bomb Suspect," *New York Post*, September 19, 2016, http://nypost.com/2016/09/19/heres-how-you-got-a-mobile-alert-on-the-chelsea-bomb-suspect/.

Figure 9. Terrorist Threat Notification on Mobile Device[113]

B. CONCLUSION

Using both GIS technology already available on FDNY computers and a new FDNY mobile application could provide more efficient and effective opportunities to share information with department personnel. Current dissemination practices in the FDNY rely on slow processes that are either unreliable or ineffective at reaching every member of the department. The FDNY can leverage its GIS unit to share situational awareness information affecting day-to-day operations as well as terrorism-related information. Developing a mobile app for the FDNY can enhance the safety of members by allowing field personnel to access critical information when necessary. Front-line members could use an FDNY app to push and pull information to and from all members of the department. Using mobile technology to share information could build a linked network among all members of the FDNY. Properly disseminating threat and safety information through a mobile application could satisfy the intelligence needs of all field personnel.

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[113] Source: "New Yorkers get alarming emergency alert about Chelsea bombing suspect," PIX 11, September 19, 2016, http://pix11.com/2016/09/19/new-yorkers-get-alarming-emergency-alert-about-chelsea-bombing-suspect/.

VI.   FINDINGS AND RECOMMENDATIONS

This chapter provides recommendations for how to improve information sharing within the FDNY. These recommendations are based on the analysis and findings from previous chapters. In addition, this chapter provides guidelines for implementing organizational change within the FDNY. These guidelines were synthesized from select organizational change theories and analysis of both successful and failed changes by the FDNY.

A.   FINDINGS

Scholars and practitioners have researched and written on the importance of information sharing among agencies, beginning with the *9/11 Commission Report*. The Fire Service Intelligence Enterprise (FSIE) was an information-sharing initiative that attempted to enhance communication but struggled to remain relevant and eventually dissolved. Similarly to Joshua Dennis's thesis, the FSIE was focused on organizational sharing from the 10,000-foot level. This research took the baton and started a conversation on how to better share information within an individual organization. Without first building a solid internal communication foundation, any type of information-sharing endeavor with other agencies is destined for failure. This thesis focused on the FDNY's communication practices to analyze specific information-sharing gaps still existing since the 2002 McKinsey & Company report. Assessing areas in which the department can improve internal information sharing was essential for providing appropriate solutions. Practitioners have argued that FDNY service members acting as gatherers of information could benefit the IC and LE. These FDNY members are perfectly postured to collect and report threat and safety information due to their public accessibility. Firefighters and EMS personnel randomly discover all types of clandestine activity while responding to emergencies. This raw information could provide IC members and LE key pieces of intelligence these agencies would otherwise not be able to obtain.

1.   Information Sharing from the Front Line

Although preventing terrorism appears to have been New York City's focus in the years following 9/11, the FDNY provides its members very little instruction for identifying and reporting suspected terrorist activity. The FDNY instructs its firefighters and EMS personnel who suspect terrorist activity to not confront individuals and to notify the Bureau of Fire Investigation. The department preaches, if you see something, say something.[114] Although DHS's "If you see something, say something" campaign seems to be working, it is not specific enough for the FDNY. The FDNY is using a campaign designed to engage ordinary citizens to participate in the homeland security enterprise. Although the campaign has merit, the FDNY may not have the right policy in place to facilitate when members need to "say something." When members encounter suspected terrorist activity, current policy only requires notifying FDNY fire marshals. There is no procedure in place to share this information with the NYPD or other LE agencies. Notifying the NYPD seems a logical step in the communication process when someone discovers suspected terrorist activity. Conversely, it is likely NYPD intelligence has certain information FDNY fire marshals and members of the Joint Terrorism Task Force do not. Information sharing between these organizations must be reciprocal. In contrast to the procedure for suspected terrorist activity, the ERP bulletin requires officers to notify the battalion chief, deputy chief, hazardous materials unit, the Bureau of Fire Investigation, and the NYPD upon discovering clandestine drug laboratories.[115] LE is notified here to help mitigate the situation. There is no clear indication in FDNY procedures why the NYPD is notified for one type of incident, but not another.

2.   Information Sharing for Situational Awareness

Much of the existing research focuses on inter-agency information sharing, not on how one organization shares important information within its own respective agencies. Valuable pieces of information affecting the situational awareness of all FDNY members have not been disseminated effectively. Information that needs to be shared includes

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[114] FDNY, "Operations at Explosive or Incendiary Incidents," in *Fire/EMS Tactics and Procedures*, Addendum 3 (EMS OGP 105-01) (New York: FDNY, 2015), 28.

[115] Ibid., 29.

threat and safety information affecting daily operations as well as potential terrorist activity. A dearth of these types of information threatens the life and safety of fire and EMS personnel. Threat and safety information is oftentimes analyzed in a deductive fashion within the FDNY, limiting the type of information front-line members receive. By gathering the fragments from front-line members, the department can build a composite of what is happening in New York City. Combining these two approaches— deductive and inductive analysis—provides comprehensive awareness and potential intelligence to homeland security partners and the IC. Figure 10 represents the deductive threat analysis currently taking place within the FDNY's CTDP. Deductive analysis uses various threats represented by the letter T, from other areas around the world, to assess for potential threats to New York City and the FDNY. This information is pushed out to front-line members through *Watchline*.
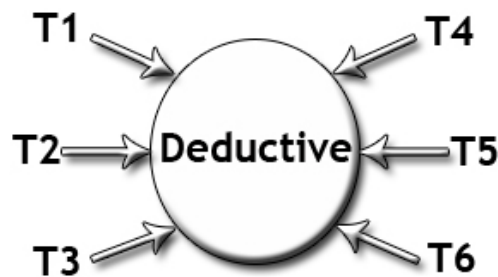

Figure 10. Deductive Threat Analysis

In contrast, Figure 11 represents the inductive threat analysis needed within the FDNY in which T equals threat. This model pulls information from front-line members to create an awareness of specific threats actually present within the city. This flow of information pulls and pushes raw information experienced by members from and to the workforce.
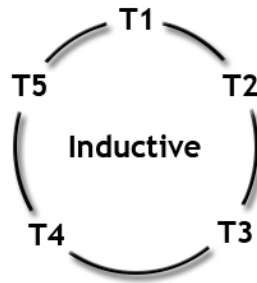
Figure 11. Inductive Threat Analysis

3.   Potential of DiamondPlate

Improving the push and pull of information to and from the outer edge of the workforce could enhance members' situational awareness. The department has recognized the importance of information sharing with its members through the implementation of DiamondPlate in 2011. While DiamondPlate has given the department a great tool to push information to the workforce, this information system does not allow the FDNY to pull of information from the front lines. This limitation inhibits potential communication of valuable or even critical information.

DiamondPlate data provided quantitative analysis to support the need for new technological solutions for sharing information. Although DiamondPlate is the only web-based information-sharing platform in the FDNY, it struggles to reach most fire and EMS personnel. Of the 14,000 personnel with access to DiamondPlate, an average of only 252 viewed a featured item every seven days.[116] There are several reasons for this disconnect. First, the accessibility of DiamondPlate is extremely limited. Members have no access to the information while off duty, and when on duty, units are busier than ever. Thus, there are limited opportunities to sit at the DiamondPlate-accessible kiosk and review new information. Having one computer kiosk in the firehouse and EMS station also limits chances for professional development. EMS personnel experience the worst access to DiamondPlate because members spend their entire tours of duty on ambulances, which lack DiamondPlate access.

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[116] "FDNY Vital Statistics Fiscal Year 2014."

Field personnel are concerned they are not receiving potentially life-saving information at the front-line level. The results from the internal FDNY survey, as discussed in Chapter III, suggest there are information-sharing gaps within the FDNY to and from the front line. Approximately 99 percent of FDNY members surveyed believe learning about suspicious activity from around the city is relevant to their jobs. Approximately 93 percent use apps on their smartphones while 85 percent would like to learn about suspicious activity via an app. The nefarious behavior a fire company experiences in Brooklyn can affect the situational awareness of other units from different boroughs. If the FDNY can leverage FDNY Mobile to share threat and safety information with its personnel, the department will enhance the safety of its workforce. A more efficient communication practice within the FDNY provides a building block for better inter-agency information sharing.

4.   Existing Technology

The FDNY's GIS Unit has the capability to share information with all members of the department. According to a white paper by software supplier Esri, GIS technology can "retrieve large amounts of data maintained by agencies … and allows fire staff to access and integrate diverse datasets with existing preplanning, incident, and other fire data."[117] The fire service already uses GIS technology to share particular information with personnel from all levels of the department. This technology has tremendous potential as an information-sharing platform, but access is limited to the lone kiosks in each firehouse and EMS station. Cultural practices also inhibit the use of GIS technology within the FDNY. Members have never been afforded training on how to use the software and have not yet embraced the platform as an information-sharing tool. While other departments use GIS technology to its fullest potential, the FDNY is just beginning to realize the potential benefits of a technology it already has in place.

Implementing a new FDNY mobile app could connect fire and EMS personnel for the first time in the department's history. In addition, fire and EMS members could

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[117] Esri, *GIS for the Fire Service* (Redlands, CA: Esri, 2012), https://www.esri.com/~/media/Files/Pdfs/library/whitepapers/pdfs/gis-for-fire-service.pdf.

connect with coworkers from other firehouses and EMS stations. According to the DHS Science and Technology Directorate, expanding into mobile-friendly applications is a great way to reach much the population.[118] By leveraging mobile app technology, the department could share valuable information that would otherwise go undisclosed. Connecting members of the department through a mobile app builds a network that could satisfy the intelligence needs of all field personnel.

5. Learning from Failures

Synthesizing organizational change theories with the FDNY's successful and failed change attempts is necessary for determining key factors when implementing change. However, implementing change within the FDNY is not an easy task. In order for the department to adopt a mobile application, senior leadership must support the initiative. In addition, it is essential that front-line members provide feedback so their operational requirements are met throughout the change process. These requirements set forth by the workforce allow for the department to pivot when necessary and offer the best possible product to connect all members of the workforce. Common threads found in successful changes made by the FDNY included managerial support, a sense of urgency for the change to be made, a willingness to separate from the past, and pilot programs for the recommended change. Piloting a change is necessary for successful implementation. Without a pilot program and feedback from membership, even a successful change can collapse and fail. DiamondPlate was successfully implemented, although not piloting the program appears to have hindered its reach and effectiveness. Critical factors found in failed attempts at implementing change in the FDNY included a lack of managerial support, poor implementation planning, a lack of understanding of the organization's intentions, and employees' attitudes toward the change.

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[118] DHS, *First Responder Communities of Practice Virtual Social Media Working Group Social Media Strategy* (Document # DHS2012C041) (Washington, DC: DHS, 2012), https://www.hsdl.org/ ?view&did=722651.

6. Leavitt's Diamond

Leavitt's Diamond provides a simple framework to ensure change is successfully implemented. Notably, even when following the guidelines set forth by Leavitt—as seen in the FDNY SAR program example—without managerial support, the change initiative can fail. Leavitt's Diamond could provide the FDNY with the ability to understand which aspects of the department need to be changed and when any change initiative is taking place. In the case of implementing a new FDNY mobile app, the department is changing the technology variable in Leavitt's model. In doing so, the department must address the necessary changes to the corresponding structures, tasks, and people. According to Leavitt, organizations remold themselves not in direct response to great ideas, but for the development of new intervening technology.[119] Better connecting the FDNY workforce and making communication easier comes from the development of a new FDNY mobile application.

7. Going Forward

Improving communication between members and headquarters could enhance the safety of members from both fire and EMS. Sharing FDNY threat and safety information in a more effective fashion can benefit other agencies as well. With a clearer picture of what is actually going on around the city, the department can leverage this knowledge to create a safer working environment and also share this data with LE and the IC. Information collected by members of the department could contain sensitive LE data that affects ongoing investigations. Providing all members of the department with training on how to share this type of information is necessary if the department wants to successfully implement the intelligence practices listed in its 2007 strategy.[120] Better connecting members of the FDNY strengthens the department's node in the LE and IC networks.

If an organization the size of the FDNY can use mobile technology to connect all members of the department, other organizations can use the same type of technology to enhance their information sharing. Mobile applications are used by a variety of public

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[119] Leavitt, "Applied Organizational Change in Industry," 1148.

[120] Bloomberg, Scoppetta, and Salvatore, *Terrorism and Disaster Preparedness Strategy*.

safety agencies to communicate with the public. According to Pew Research, over 75 percent of Americans are using smartphones and a growing number of the population uses smartphones as a primary means of online access at home.[121] As technology advances and its adoption is universally accepted by a younger generation, organizations have more effective and efficient options to share information with their workforce.

8.   A Need for Parity

There is parity between the FDNY and the NYPD, but only to an extent. Throughout the city's history, the FDNY and NYPD have responded to the same types of emergencies. According to John Buntin, "The NYPD and the FDNY have more overlapping services than most urban police and fire departments."[122] Whether it is a disaster like Hurricane Sandy, a terrorist attack like 9/11, or an overturned vehicle with people trapped inside, these two great departments respond to save lives whenever they are called. Though there is parity between the FDNY and NYPD in certain response considerations, when it comes to technological implementation, a gap remains. In 2014, the NYPD received 6,000 tablets (one for every squad car) and 41,000 smartphones for officers throughout the department.[123] These devices help officers with field work by providing access to information and databases. The NYPD's new smartphones are equipping officers with an app called the Domain Awareness System, otherwise known as DAS Mobile.[124] According to Alfred Ng of CNET, "On a single day … 5,500 NYPD officers logged in and clicked on 39,000 notifications. They're not distracted from work, though. Those notifications were 911 calls."[125] Figures 12 and 13 depict the new NYPD smartphone and login process.

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[121] "Mobile Fact Sheet," Pew Research Center, January 12, 2017, http://www.pewinternet.org/fact-sheet/mobile/.

[122] John Buntin, "Battle of the Badges," *Governing*. September 2005, http://www.governing.com/topics/public-justice-safety/Battle-Badges.html.

[123] Thomas Tracy, "NYPD Squad Cars to Get Tablet Computers, Smartphones Funded by Wrongdoer Banks," *New York Daily News*, October 24, 2014, http://www.nydailynews.com/new-york/nypd-cops-tablet-computers-smartphones-article-1.1984467.

[124] "Domain Awareness System (DAS)," Microsoft, February 20, 2013, http://www.officer.com/product/10888106/microsoft-government-domain-awareness-system-das.

[125] Alfred Ng, "This Is NYPD's Official Crime-Fighting Phone," CNET, October 13, 2016, https://www.cnet.com/news/nypd-new-york-police-official-crime-fighting-windows-phone/.

Figure 12. NYPD-Issued Smartphone[126]

Figure 13. NYPD Officer Logs into His Phone Using His Police Identification[127]

[126] Shane DiMaio, "NYPD Lieutenant Uses Cell Phone to Bust Alleged Burglar in West Brighton," SILive, April 23, 2016, http://www.silive.com/news/index.ssf/2016/04/nypd_lieutenant_uses_cellphone.html.

[127] Ng, "NYPD's Official Crime-Fighting Phone."

New York City Mayor Bill DeBlasio recognized the value of this technology in the hands of field personnel. The mayor stated, "The new technology is invaluable in the war on terror.… Just imagine for a moment information instantaneously going to each and every one of our 35,000 officers."[128] Firefighters are starving for this type of access to situational awareness information and intelligence. It is time for technological parity between these two departments.

Building an FDNY mobile app takes much of the information disseminated by the department and transforms it into a digital sharing environment. The development of such a program could answer this author's research question, which so few have studied—How can the FDNY better inform its members of threat and safety information? FDNY Mobile can provide the department with a tool to effectively push information out to a workforce in need of unshared threat and safety information. In addition, the technology will allow the department to easily pull this type of information from front-line members. Investing in FDNY Mobile builds a solid information-sharing network for the FDNY and aids future inter-agency sharing endeavors with the NYPD and other homeland security partners.

B.   RECOMMENDATIONS TO ADDRESS ISSUES IDENTIFIED AS CHALLENGES

Without FDNY managerial support, any change attempt likely ends in failure. This barrier to change is critical within the FDNY, regardless of the change initiative. Several change barriers must be addressed in order to facilitate the department's use of FDNY Mobile. Senior leadership must acknowledge the current information-sharing gaps within the department as well as the intelligence needs of FDNY personnel. There is a sense of urgency when learning of the information-sharing gaps and how many members of the department remain uninformed. These feelings could allow senior leaders to separate from past communication practices and support a new technology for improving the dissemination of threat and safety information.

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[128] Ibid.

To implement an FDNY mobile app, the organizational change barriers highlighted in this thesis need attention. Critical factors impacting the adoption of this new mobile technology were derived from synthesizing organizational change theories discussed in Chapter IV along with FDNY change examples. Resistance to change in the FDNY has included personal and organizational factors as well as factors that are specific to the change itself. Addressing change barriers and creating new policies can help build a new information-sharing framework for the FDNY. This section outlines eight recommendations for implementing FDNY Mobile.

(1)   Employees' Attitudes/Disposition toward the Change

As seen in the 2007 FDNY strategy, firefighters and EMS personnel must believe in the mission at hand. If the change is too invasive, it has the potential to sour the attitudes of the workforce, resulting in a potential failure. Based on the survey data, members have expressed a need for better information sharing and a willingness to use mobile technology. The results from the survey suggest the workforce would accept this new information-sharing technology.

Recommendation #1: Adopt a new FDNY information-sharing strategy.

(2)   Lack of Understanding of the Organization's Intentions

The 2007 FDNY strategy suggested FDNY personnel should augment their roles by becoming "first preventers," first responders who are able to recognize threats to homeland security, report the suspicious activity, and preserve the scene for law enforcement.[129] Members understand their access and response provides an opportunity for potential intelligence collection. What they do not understand is how to go about collecting this data and how to appropriately share it with the workforce. While members of the department are given an eight-hour training class to better recognize such activity, it is not enough to impact their situational awareness and improve information sharing.

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[129] Bloomberg, Scoppetta, and Salvatore, *Terrorism and Disaster Preparedness Strategy*.

Recommendation #2: In order for the workforce to buy into FDNY Mobile, the department must express the need for the application as well as explain how members should use such a technology. Adding a segment to the curriculum of the eight-hour terrorism awareness class provides necessary training so all members understand the purpose of the app and department procedures surrounding its use.

(3)   Disruption of Routine

Firefighters and EMS personnel are creatures of habit. The foundation of their job function requires them to work in a regimented fashion, but adapt to unpredictable emergencies as well. When responding to incidents around the city, these professionals rely on standard operating procedures to mitigate a variety of emergencies. However, oftentimes these responders must adapt or deviate from routine practices to get the job done. FDNY Mobile will disrupt the routines of the FDNY workforce. Nevertheless, if the technology is not disruptive, its benefits will not be as impactful.

Recommendation #3: Connecting all members of the FDNY to each other and with headquarters through a mobile application will provide members an alternative to past inefficient communications. Department-wide acceptance of FDNY Mobile is possible because responders have shown their ability to adapt when necessary. According to Leavitt, human acceptance is the real carrier of any change initiative.[130]

(4)   Lack of Rewards for Implementing Change

The FDNY is an organization built around merit. This meritocracy begins with the FDNY entrance exam and continues through promotional exams. The department awards points on future promotional exams to members who successfully revive a patient found in cardiac arrest or go above and beyond the call of duty during a fire.

Recommendation #4: This same type of recognition is needed when members discover potential terrorist activity and appropriately report it. If the dissemination of this potential intelligence leads to successful law-enforcement apprehension, it only makes sense that the unit uncovering the threat receives recognition.

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[130] Leavitt, "Applied Organizational Change in Industry," 1150.

(5) Organizational Size and Rigidity

Even though the FDNY is one of the largest fire departments in the country, it has proven itself capable of making department-wide changes when necessary. Implementing a new technology to improve information sharing is familiar territory for the department.

> **Recommendation #5**: Members working on initiating FDNY Mobile could use the DiamondPlate endeavor as a successful model. The project charter for DiamondPlate required delivering a broad range of information and knowledge to members in the field in a quick and efficient manner.[131] Front-line members chosen by bureau heads worked with technical support staff to produce content based on their subject-matter expertise. Those who developed DiamondPlate had to familiarize themselves with new technology in the form of Adobe Creation. Multiple groups consisting of both uniformed and non-uniformed personnel worked seamlessly to get DiamondPlate up and running. These groups included FDNY Operations, the Bureau of Technology Development and Systems, the Bureau of Training, and the CTDP, among many others.[132] Although this thesis has questioned the reach of the DiamondPlate platform as an information-sharing tool, it certainly recognizes the platform's successful navigation through many organizational change barriers.

(6) Lack of Management Support for the Change

According to Mosca and Rosenberg, "There cannot be any resistance on the part of management in order for an organizational change to be successfully implemented."[133] Every successful FDNY change studied in this research had the support of senior leadership. While this support does not guarantee success, it certainly increases the probability of successful implementation. Senior leaders have supported the idea of increasing the prevention and deterrence capabilities of their personnel, but front-line members have received neither sufficient training nor the appropriate tools to adequately share and receive gathered information.

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[131] Dowling and Spadafora, "FDNY DiamondPlate," 30.

[132] Ibid.

[133] Mosca and Rosenberg, "Breaking Down Barriers," 144.

Recommendation #6: Create a sense of urgency by presenting this research to senior-level leadership. Inform these key FDNY leaders of the first responders' need for FDNY Mobile, and how similar mobile technology is already used to connect with the public.

(7)   Poor Implementation Planning

When electing to build FDNY Mobile for its workforce, the department must pay particular attention to how the technology is implemented. According to Mosca and Rosenberg, "If organizations can take the right steps to strengthen the execution of their change strategies, then the odds of success for change will likely improve."[134] Working with members in the field is essential to ensuring the most important information is shared via the app. Many successful FDNY changes in the past incorporated a piloting program. Even though the idea is to get this type of technology in the hands of as many FDNY firefighters and EMS personnel as possible, the department should not unveil the app for the entire organization right away. As seen with DiamondPlate, an innovation can provide excellent content, but if the FDNY does not implement FDNY Mobile in the right way, intended results could suffer.

Recommendation #7: The department has a significant amount of information it needs to share to improve situational awareness and uncover potential terrorism. The FDNY must handle collected information with a potential nexus to terrorism in a different manner than current policy prescribes. Sharing this type of information with the NYPD in addition to the Bureau of Fire Investigation should fill a portion of the inter-agency information-sharing gap still existing between the two departments.

(8)   Leavitt's Diamond for FDNY Mobile

According to Leavitt's construct, incorporating new technology into the FDNY will affect the structure, task, and people variables at work. Failing to modify all variables at the same time negatively impacts implementation. Figure 14 superimposes FDNY Mobile as a technology, as well as the FDNY's affected structure, task, and people variables, onto Leavitt's Diamond.
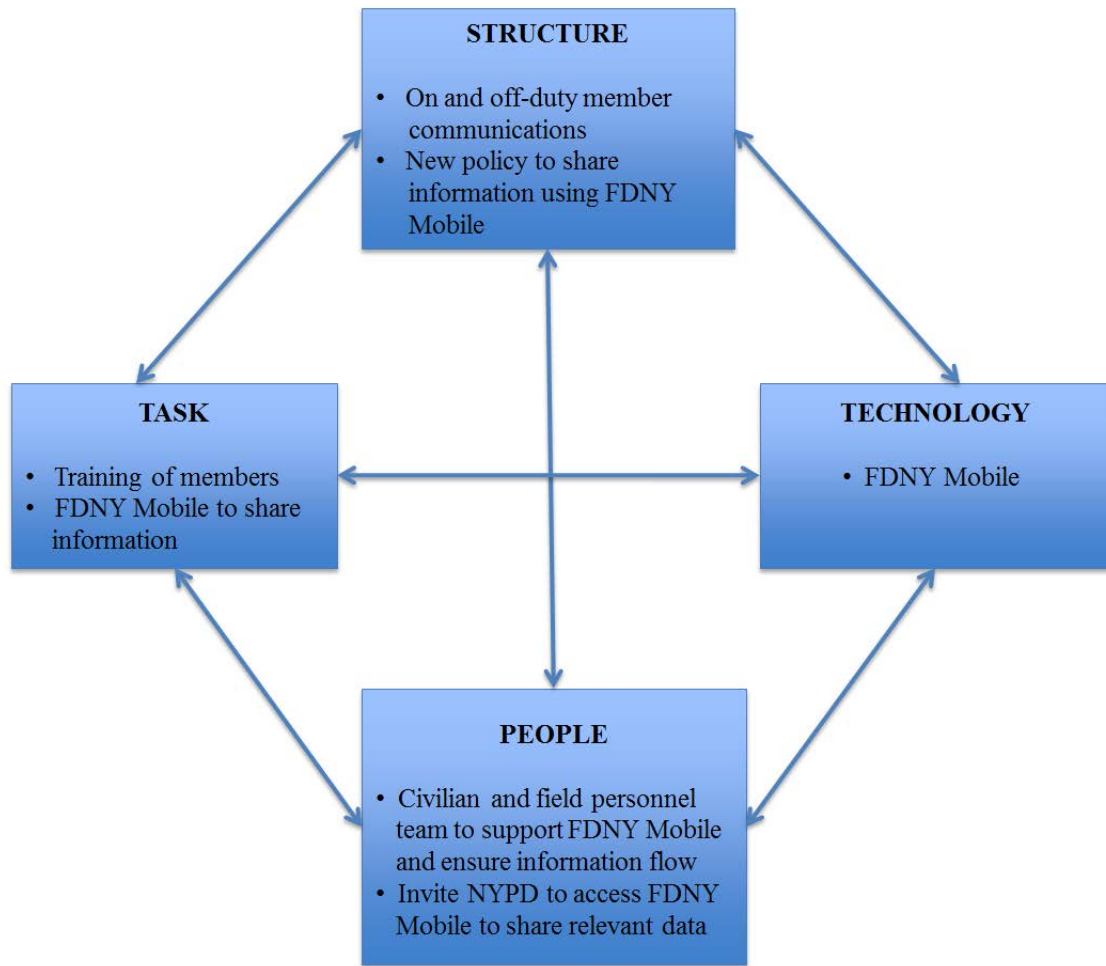
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[134] Ibid., 143.

Figure 14. FDNY Mobile in Leavitt's Diamond

Recommendation #8: When implementing FDNY Mobile, the department needs to change the following variables:

a) *Task*. According to Leavitt, "One improves performance of tasks by clarifying and defining the jobs of people and setting up clearly defined relationships among those jobs, with authority, responsibility, and coordination mechanisms spelled out."[135] Members need training for how to appropriately use FDNY Mobile. Members are sharing information now, just not in the most efficient way. In lieu of using a fax machine, an officer would use the mobile app to communicate threat and safety information to other members of the department.

b) *Structure*. As Leavitt's model predicts, the system of communication and workflow within the FDNY will change due to this new technology. Members will now have the ability to share and receive information while away from the firehouse or EMS station. This applies to both on-duty and off-duty members. While this change improves information sharing for firefighters, it will drastically improve access to information for EMS personnel as there is no intranet access provided on ambulances. Because the FDNY is dependent on its procedures to define the tasks of its workforce, the department will need to create new policies that codify how to share information using FDNY Mobile.

c) *People*. Implementing a department-wide change through a new communication tool requires staff to support such an initiative. This change should involve members of the FDNY Information and Technology Department along with front-line fire and EMS members. This mix of civilian and field personnel worked well together during DiamondPlate's development. Changing the technology the department uses to share information presents an opportunity to invite the NYPD to access FDNY Mobile. This mobile application has the potential to improve the flow of threat and safety information as well as actionable intelligence between these two departments.

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[135] Leavitt, "Applied Organizational Change in Industry," 1146.

C.   FINAL THOUGHTS

This thesis placed the FDNY under a microscope to highlight internal information-sharing gaps that still exist within the organization. Initial research was dedicated to finding solutions to the continued inter-agency communication problems between the FDNY and NYPD. This author believes many scholars have focused their research on inter-agency communication because the federal government has placed significant emphasis on this goal. These efforts have put the cart before the horse. This is not to say their research was wasted. In fact, it was necessary to bring this author to the conclusion that very little research has focused on information-sharing practices of individual organizations. If the federal government places more emphasis on improving information-sharing practices at the individual organizational level, change initiatives involving inter-agency information sharing should have a better shot at successful implementation. We have learned over the years that if the FDNY and other agencies continue to silo potential life-saving information, the next Chief Fahy tragedy looms unnecessarily in the first responders' future.

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