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Method to Extend Logistical Support for Long Duration Incidents and Special Events

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CERTIFICATION STATEMENT

I hereby certify that this paper constitutes my own product, that where the language of others is

set forth, quotation marks so indicate, and that appropriate credit is given where I have used the

language, ideas, expressions, or writings of another.

Signed: _____

Abstract

The applied research project examined a problem that exists within Chesterfield Fire and EMS (CFEMS), Virginia. The problem is that the Resource Management Division does not have the manpower to extend logistical support for long duration incidents or special events. In the past, the Emergency Operations Division would improvise and utilize whatever on-duty personnel and material assets were available to extend logistical support. Once the companies were assigned to logistical tasks, they were no longer available for emergency response. The purpose of the research was to find a method to extend logistical support for CFEMS during long duration incidents and special events. The project applied the descriptive method to answer the following questions: (a) What is needed to provide extended logistical support?, (b) What are the problems with extended logistical support?, (c) How does the CFEMS organization believe extended logistical support should be managed?, (d) How do other organizations manage extended logistical support?, and (e) What are available assets that could be utilized for extended logistical support? The findings from the topical literature review were augmented with original data from interviews, personal observations, personal correspondence, and two surveys.

The seven identified components needed for extended logistical support were (a) nourishment, (b) sanitation, (c) shelter, (d) transport, (e) manpower, (f) fuel and power supply, and (g) a plan. Inadequate manpower and planning were the most prevalent problems found. The analysis of methods from other organizations revealed sophisticated concepts and models. The key recommendations were to assemble material assets at one location, to utilize CERT and Volunteer Recruitment to augment manpower, to adopt a model for extended logistical support, and to develop a written procedure that complements the model and outlines its scope and processes.

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Introduction

"Logistics is the umbilical cord of an incident" (McLaughlin, 2010). While the intact umbilical cord sustains life, functional logistical support sustains fire service operations. Logistical support to front-line operations is of the essence, not only at incidents with multiple operational periods, but also during special events, and even more so during the recovery phase of a disaster. "There are few things more critical to our response to and recovery from a disaster than having and executing an effective logistics plan to provide critical resources support" (Smith, 2010, p. 9). The prominence given to logistical support in emergency management has gained momentum after the 2005 hurricane season, when it became undeniably evident that response and recovery operations depended on functional and sufficient logistical support. The importance of planning for logistical support is emphasized in the National Response Framework (NRF), where it states that "the mobilization, tracking, use, sustaining, and demobilization of physical and human resources require an effective logistics system" (U.S. Homeland Security [DHS], 2008, p. 30).

Emergency operations' dependency on logistical support applies to all levels of government, from the Federal Emergency Management Agency (FEMA) down to Chesterfield Fire and EMS (CFEMS). The problem is that CFEMS' Resource Management Division (RMD) does not have the manpower to extend logistical support for long duration incidents or special events.

The purpose of the research is to find a method to extend logistical support for CFEMS during long duration incidents and special events. The research project applied the descriptive research method to answer the following questions: (a) What is needed to provide extended

logistical support?, (b) What are the problems with extended logistical support?, (c) How does

the CFEMS organization believe extended logistical support should be managed?, (d) How do

other organizations manage extended logistical support?, and (e) What are available assets that

could be utilized for extended logistical support?

<div align="center">Background and Significance</div>

The area of Chesterfield County is 446 square miles, which makes it the fourth largest

county in the Commonwealth of Virginia. It is located in Central Virginia on the outskirts of the

capital city of Richmond. The County has been prosperous in many ways. The Chesterfield

population has increased by 51.85% in the last twenty years and reached 317,800 citizens in

2010. The population is forecasted to continue to grow by 35.68% to 431,200 by 2030. At this

rate, the County will gain an average of 5,670 new citizens per year over the next two decades.

While Chesterfield County has traditionally been known as a "bedroom community" for the

Richmond Metro Region, it has in recent years developed a healthy local economy and job

market. Between 1998 and 2008, there was an average of 151 new commercial and industrial

constructions in the County with an average value per building of $976,208. Additionally, and

despite the economic downturn, there were 643 commercial building permits with an estimated

construction value of $100 million issued in 2009 (Chesterfield County Planning Department

[CCPD], 2009; Chesterfield County Government, 2010a).

The growing Chesterfield community warrants an appropriate emergency management

organization. This is the responsibility of CFEMS, a combination department with 303 career

firefighters, 120 career officers, and 43 civilian employees (T. Tucker, personal communication,

December 13, 2010). The full-time body of employees is augmented by approximately 155

active volunteers (Chesterfield County Government, 2010b, Fire and EMS section, ¶ 1). The

department's 21 fire stations and 9 volunteer rescue stations responded to 32,971 calls for

service in calendar year 2010 (Visual Fire NFIRS Incident Reporting (Version 5.13.16), 1995-

2011). The County's growth is reflected in the increased call volume for CFEMS. The number of

calls for service has amplified by 18.66% since 2005. In response to the foreseeable increasing

demand for fire and emergency medical services, the County intends to add 9 new fire stations

and to relocate and replace 5 existing fire stations within an approximate 20 year timeframe

(Chesterfield County Government, 2010c, p. 121-122).

      In the past, CFEMS responded to the swelling demand for service by adding resources to

the Emergency Operations Division (Operations). Manpower for the Resource Management

Division (RMD), on the other hand, did not grow proportionally. There have been 5 new stations

added since 2000 without increasing the manpower for RMD to manage the additional workload.

As a result, RMD has become consumed with the day-to-day tasks of keeping up with delivering

supplies to the stations and orchestrating the maintenance of the CFEMS vehicle fleet and

facilities. An extension of RMD's services to logistical support at long duration incidents and

special events is currently not feasible and remains out of reach.

      RMD is comprised of the Fixed Facilities Unit, the Maintenance & Logistics Unit

(M&L), and an administrative position. Appendix A displays the organization chart for RMD. A

captain is the unit leader for M&L and oversees two lieutenants and one civilian supervisor. One

of the lieutenants coordinates vehicle maintenance, repairs, and replacements. This position is

supported by a civilian part-time assistant. The other lieutenant manages all vehicle accessories,

e.g., radios, hose, tools, etc. This position oversees a part-time Self Contained Breathing

Apparatus (SCBA) technician. The logistics supervisor oversees a full-time logistics technician

and a part-time maintenance worker. These three members are civilian employees.

CFEMS does not currently have a written plan or procedure that specifically addresses logistical support for long duration incidents and special events. There are two written procedures that provide some guidance for logistical support to front-line personnel, but both are limited to food and drink service. Operational procedure #14 "Obtaining Food From WAWA During Emergency Incidents" outlines the process for obtaining food, when personnel are on scene for an extended period of time. The procedure advises to contact Volunteer Company 13 Auxiliary first. As a second option, the procedure instructs to call any WAWA gas station/convenience store and to inquire, if they are able to provide sandwiches and drinks (Chesterfield Fire and EMS [CFEMS], 2003, p. 1). CFEMS operational procedure #36 "Emergency Scene and Training Rehabilitation" provides guidance with the type of treatment and food that should be provided at the rehabilitation area. It neither specifies who delivers the food and drink, nor how it will be distributed. For major incidents, the procedure points out that allied agencies and organizations, such as Volunteer Company 13 Auxiliary and the American Red Cross, should be considered for assistance (Chesterfield Fire and EMS [CFEMS], 2005, p. 3).

The Volunteer Company 13 Auxiliary, mentioned in the two operational procedures, is a group of 11 non-operational volunteers, who have specialized in supplying front-line resources with food and drink. The group utilizes a refurbished ambulance, provided by CFEMS, to deliver the supplies to the scene. The unit designation is *Rehab 13* and can be activated by the Emergency Communications Center (ECC) at the discretion of the incident commander (IC). There are no written procedures that outline the activation process, activation trigger points, or performance expectations of Rehab 13. Additionally, there is no data available that would allow analysis of response reliability, performance, and service capacity of Rehab 13.

In the past, when there was a need for extended logistical support, Operations would improvise and utilize whatever on-duty personnel and material assets were available. One of these assets is a Western Shelter System. This is a shelter system that consists of tents, lights, HVAC units, water purification and distribution equipment, and power generators. Generally, Operations would commit one or two companies for logistical support. For special events, Operations would assign two companies, supplemented by hire-back operational personnel on overtime compensation. Once the companies were assigned to logistical tasks, they were no longer available for emergency response.

The problem with deficient extended logistical support is not new but has remained on the back burner of projects. The problem surfaced as early as the fall of 2005, when CFEMS' Incident Management Team (IMT) deployed to Louisiana in the aftermath of Hurricane Katrina and again for Hurricane Rita. It was recognized that CFEMS had no plan or procedure in place to logistically support personnel over an extended period of time. In February 2006, CFEMS was called to Commodore Point at the Swift Creek Reservoir in Chesterfield County for two missing boys. The Commodore Point Incident lasted 11 days with 60 to 70 personnel on site every day (G. Pruden, personal communication, November 30, 2010). Operations improvised the logistical challenges with the help of on-duty companies and personnel from other divisions. In September 2008, CFEMS was summoned to a building collapse in Chester. The Chester Village Green Incident lasted 48 hours with 19 CFEMS and 10 mutual aid units on scene (Chesterfield Fire & EMS [CFEMS], 2008, p. 28). Logistical support was a challenge and had to be overcome by assigning on-duty companies to logistical tasks. In May 2010, CFEMS was asked to logistically support the Strawberry Hill Races at Colonial Downs, New Kent County, Virginia, with tents from its Western Shelter System. Operations took an on-duty engine and truck company out of

service and hired two operational personnel on overtime compensation and assigned them to the

deployment. In June 2010, CFEMS received a request to logistically support a large scale

training exercise in Henrico County, Virginia, with tents. Operations assigned an engine and a

truck company to set up Western Shelter tents. After the exercise, CFEMS took two engine

companies out of service to break down and return the tents to storage.

Over the past 5 calendar years, CFEMS has managed 72 operations that lasted longer

than 6 hours, 17 of which extended over 12 hours. This number of long duration incidents

constitutes a yearly average of 14 incidents that extended to more than 6 hours and 3 incidents

that extended beyond the 12 hour benchmark (J. Kelly, personal communication, January 12,

2011). Appendix B illustrates the break-down and the averages of long duration incidents by

calendar year.

Even though Operations managed to accomplish the logistical tasks every time, extended

logistical support was achieved at the expense of emergency response coverage. While on-duty

operational resources were committed to logistical tasks, their first due response areas had to be

left without coverage. CFEMS' mission reads, "We provide excellent customer valued service in

prevention, education, professional service and emergency response. Great Service by Great

People". The current practice, however, relies on committing front-line response units and on

making impromptu decisions to support long duration operations. This in return, jeopardizes in

part CFEMS' mission to provide excellent valued service in emergency response.

Extended logistical support is not a unique CFEMS problem but is a common

phenomenon across the emergency management field. In 2010, the Office of the Inspector

General (OIG) published a report that addressed the strengths and weaknesses of FEMA. The

report stated that "despite progress at the federal level, corresponding improvements in many of

the state and local governments have lagged behind due to staffing and budget restrictions" (U.S. Department of Homeland Security, Office of Inspector General [OIG], 2010, p. 1). For this reason, the findings from this research project will not only offer a solution for CFEMS but will have the potential to equally benefit other fire departments as well.

The challenge of sustaining logistical support during long duration incidents and special events did not arise suddenly but has been building up with the social and economic development of Chesterfield County and the resulting organizational growth of CFEMS. The problem came to the author's attention when he was assigned to the fire station that houses the Western Shelter System. At that point, the author witnessed first-hand the challenges of providing extended logistical support with on-duty operational personnel and the perplexity of not having a formal plan for logistical support. As an Executive Fire Officer (EFO), it is important to the author to invest his time and energy in seeking a solution to the problem, rather than in managing the on-going problem.

Extended logistical support for fire service operations is directly related to the Executive Analysis of Fire Service Operations in Emergency Management (EAFSOEM) course. The first terminal objective expects the students "to be able to analyze their department and community's level of preparedness" (United States Fire Administration [USFA], 2010, chap. 1). In addition, the student manual and the practical exercises during the course repeatedly emphasized the value of pre-planned and functional logistical support to front-line operations. Furthermore, in the discussion of the Emergency Operations Center (EOC), the student manual pointed out that "pre-incident planning greatly improves any fire department's management, operation and customer service initiatives" (p. 5-32). In view of the EAFSOEM curriculum, it can be asserted that this project evolved in line with the course material.

Finally, the research project supports Goal #2 and #3 of the U.S. Fire Administration

(USFA) 2010 – 2014 Strategic Plan. Goal #2 states, "Improve local planning and preparedness".

Goal #3 reads, "Improve the fire and emergency services' capability for response to and recovery

from all hazards" (USFA, 2009, p. 13).

<div align="center">Literature Review</div>

The literature review, results, and discussion sections are organized and subtitled by

research questions #1 through #5. The structured approach is intended to assist the reader with a

sense of orientation throughout the research project and to facilitate replication or expansion of

the research project.

A topical literature review was conducted with focus on existing knowledge that is

pertinent to the research questions. A concise effort was made to look at the research problem

with a wide angle view of the subject that embraced private industry, non-fire service

institutions, and career and volunteer emergency organizations in and outside the United States.

The findings from the literature were supplemented with information obtained from interviews

and correspondence with subject matter experts, who offered pertinent information to the

research questions.

Research Question #1: What is needed to provide extended logistical support?

CSS Deployed Logistics, a division of CSS Alliance, is a private enterprise that offers

"turn-key solutions" in response to disasters and special missions around the globe. The

company markets a wide variety of long-term support services that include (a) camp construction

and relocation; (b) shelter and housing; (c) cooking, dining, and laundry facilities and services;

(d) latrine and shower units; (e) medical care and clothing; (f) office facilities and services; (g)

generators; (h) bulk fuels, water, grey/black water removal; (i) water treatment facilities and

support; (j) specialized staff and management; and (k) support supplies and logistics (CSS Deployed Logistics [CSS] n.d.).

During the January 2009 Presidential Inauguration, army logisticians were planning logistical support for (a) meal service for all service personnel, (b) transportation vehicles and movement requests, and (c) types and quantities of assets. These assets included (a) signs, posts, and cones; (b) furniture; (c) sandbags; (d) cots and sleeping bags; and (e) beverage containers (Paone & Kossick, 2009, Defining Requirements section, ¶ 1).

The North Carolina State Medical Assistance Team (NC-SMAT) utilizes Western Shelter System tents and emergency shelter accessories for deployments to disasters and special events. The NC-SMAT's mission includes setting up and running a 50 bed mobile hospital, which requires six to eight Western Shelter tents (C. Starbuck, personal communication, December 13, 2010).

The National Capital Region Management Incident Team (NCR-IMT) is also using Western Shelter System tents and emergency shelter accessories for their IMT deployments (J. Ahrens, personal communication, December 12, 2010).

Miami-Dade Fire Rescue (MDFR) provides logistical support for emergency services during large scale sporting and cultural events on a routine basis. MDFR owns an arsenal of material assets for the deployments to these special events. MDFR owns and staffs all resources needed for these deployments. They include (a) tents, (b) HVAC units, (c) generators, (d) trucks for meals, (e) technical support technicians and mechanics, (f) a fuel truck, and (g) Polaris ATVs (F. Fernandez, personal communication, December 22, 2010).

Schutz & Rettung Zürich (SRZ), the career fire and rescue department in Zurich, Switzerland, has the advantage of being surrounded by a dense urban infrastructure and

resources that can easily be mobilized or tapped into. For the most part, SRZ owns its own assets for extended logistical support. These assets include (a) meal service, staffed and available 24/7; (b) three mobile medical stations; (c) fuel trailer for on-site fueling; (d) mobile command center; and (e) a stationary repair center to service and repair front-line equipment. Further logistical support with compatible, standardized equipment is readily available from surrounding jurisdictions (W. Meierhofer, personal communication, January 3, 2011).

Learning the type of resources the private industry, emergency response teams, and other fire departments utilize to sustain logistical support influenced the project with the understanding of what extended logistical support entails.

Research Question #2: What are the problems with extended logistical support?

CFEMS Emergency Management Coordinator Curt Nellis explained that a common problem was "the lack of coordination at getting the supplies to the scene". He added that "we should let the logistics section do the logistics job" (C. Nellis, personal communication, November 22, 2010). CFEMS Captain Gerald Pruden, who was the operations section chief at the Commodore Point Incident and also responded to the Chester Village Green Incident, explained that the biggest problem with extended logistical support was the lack of manpower to deploy the assets, e.g., Western Shelter System (G. Pruden, personal communication, November 30, 2010). CFEMS Fire Chief E.L. Senter explained that extended logistical support used to be an "after thought" and dealt with by Operations when the need for it was recognized. Chief Senter elaborated that adequate staffing depth and appropriate command structures are common predicaments in extended logistical operations (E. L. Senter, personal communication, February 11, 2011).

Team Leader Chris Starbuck from the NC-SMAT stated that the mobilization and clean-

up phases were two areas the team had to work on. Another problem the SMAT was experiencing was that non-SMAT members on scene were "not sticking to the planned set-up [configuration of shelters]" (C. Starbuck, personal communication, December 13, 2010).

Battalion Chief John Ahrens, logistics committee chair of the NCR-IMT, described several common problems. They were (a) obtaining information technology (IT) support, (b) rectifying incorrectly filled out order forms, (c) determining who really needed a computer, (d) shielding the logistics group from unreasonable demands by other team sections, (e) and ensuring the ordering process was in line with the ordering policies set by the agency administrator or the state (J. Ahrens, personal communication, December 12, 2010).

Before the introduction of the modular Theater Sustainment Command (TSC) concept, explained later in research question #4, the Army had to "funnel supplies and equipment through different layers of management before getting it forwarded to the battle area" (Task Force Logistics, 2004, ¶ 7). This slowed down the process and hampered prioritization and reallocation of resources (¶ 8).

During the 2009 Presidential Inauguration, army logisticians became frustrated when they had to wait for "defined operational needs" from the Ceremonies Directorate. It mandated mutual understanding and communication of expectations for the planning process to move forward successfully (Paone & Kossick, 2009, Defining Requirements section, ¶ 2).

The magnitude of the 2005 hurricane season overwhelmed the logistical capacities at all levels of government. As a result, shipments got lost in transit, spoiled food had to be discarded, and ice was left to melt. When the media covered these problems, it generated stern public criticism towards FEMA (OIG, 2010, p. 2).

It was helpful to the project to learn from a variety of sources what their challenges were

with extended logistical support. The known problems served as "red flags" during the duration

of the research project and helped to avoid the same or similar problems in the recommended

method.

Research Question #3: How does the CFEMS organization believe extended logistical support

should be managed?

Battalion Chief Steve Parrott, division head of the Resource Management Division

(RMD) believes that extended logistical support should be built on a "logistics taskforce

concept" and be in line with the National Incident Management System (NIMS) structure for the

logistics section. Chief Parrott envisions a method where the RMD staff forms the "core team"

assisted by personnel from other divisions. These support personnel would be trained in their

support roles by RMD staff. The support personnel would not have to be career operational

personnel. They could be civilians as well, e.g., Community Emergency Response Team (CERT)

members. The newly designed CFEMS logistics taskforce would consist of different specialties,

such as Western Shelter tents, water purification, etc. The support members of the taskforce

would have to recertify the skills in their area of expertise each year (D. S. Parrott, personal

communication, November 7, 2010).

Deputy Chief Jim Graham, chief of Management Services, stated that the project should

look at past significant incidents, such as the double drowning at Commodore Point and the

Chester Village Green building collapse. Next, the project should identify what the needs and the

problems were at these incidents. Chief Graham stressed the importance of knowing what the

"time and functional perimeters" are of the available resources. Furthermore, Chief Graham

explained that the development of a method to provide extended logistical support should follow

the Plan – Do – Study – Act (PDSA) Cycle (J. E. Graham, personal communication, November

16, 2010).

Mr. Curt Nellis, emergency management coordinator for Chesterfield County, stated that "we [CFEMS] have to define and differentiate between response logistics and recovery logistics". When planning for extended logistical support, CFEMS has to consider "length and magnitude of operation". Mr. Nellis emphasized that the Emergency Management (EM) Unit would like to stay an "orchestrator of resources" and prefers not to own assets because that would make EM "operational" (C. Nellis, personal communication, November 22, 2010).

Captain Gerald Pruden, Training and Education Unit, recommended splitting the resources for extended logistical support, placing them on two trailers, housing one in the North and one in the South, and training two stations on how to use them (G. E. Pruden, personal communication, November 30, 2010).

Chief E.L. Senter emphasized that the method to extend logistical support should follow NIMS. Furthermore, CFEMS should design an organizational structure that can support the extension of a logistical operation. Chief Senter stated that a regional Incident Management Team (IMT) should be the first step (E. L. Senter, personal communication, February 11, 2011).

Consulting key stakeholders and internal subject matter experts early on in the project taught the author what was important to them. Stakeholder support and understanding their points-of-view, as well as differences in opinions, was indispensable in working towards consensus and acceptance of the project's recommendations.

Research Question #4: How do other organizations manage extended logistical support?

CSS Deployed Logistics' 24/7 dispatch center initiates the customized deployments. CSS has the capability to manage its deployments with their own in-house staff of logistics

technicians. The deployments are tailored to the needs of the customer. The teams can be

deployed within hours to anywhere in the world (CSS, n.d.).

The Mesquite (TX) Fire Department (MFD) utilizes Fire Corps members to extend

logistical support. The volunteer Fire Corps members support MFD with on scene personnel

rehabilitation, assist incident command and the logistics section with manpower, and assist

residents in securing their belongings after a fire or disaster. Fire Corps also assists MFD at

special events with displays and public education (Fire Corps, n.d.b).

The Henrico County (VA) Office of Emergency Management supplied the author with a

copy of their *Emergency Support Function (ESF) #7 Resource and Logistics Management Plan*.

The plan dictates the county departments to identify essential resources needed in their

functional area to remain operational when faced with any type of disaster. It specifies that

departments with emergency functions are not only responsible for identifying their material but

also human resources required to continue accomplishing their missions. Oversight of resource

management during a disaster remains with the fire chief, who also acts as the coordinator of

emergency management. Attached to the plan is a comprehensive list of emergency resources

with contact information for ordering these resources (County of Henrico, 2009).

The NC-SMAT activates manpower based on the mission. The team has two full-time

emergency response coordinators and a full-time SMAT team leader. The rest of the SMAT is

made up of volunteers. A full field hospital with eight tents for a 24 hour operation, for instance,

requires 75 to 80 people. A pre-planned 8 to 12 hour week-end event with three tents can be

managed with about 30 people. The SMAT can deploy with less personnel if fire department or

Urban Search and Rescue (USAR) resources on site assist with manpower. In general, everybody

on the SMAT, viz., doctors, nurses, paramedics, respiratory therapists, x-ray technicians, police

officers, and other support personnel assist in setting up the mobile hospitals. The NC-SMAT conducts two deployment exercises each year (C. Starbuck, personal communication, December 13, 2010).

The NCR-IMT has approximately 125 personnel on its team. A large portion of the team is cross-trained in various disciplines and, therefore, "many duties are shared". The logistics members, however, remain responsible and supervise logistical tasks (J. Ahrens, personal communication, December 12, 2010).

On average, Miami-Dade Fire Rescue (MDFR) implements extended logistical support four times per year. Because of the high frequency of large scale special events, MDFR has established a Special Events Bureau to orchestrate staffing. MDFR's Logistics Division is 125 personnel strong, half career and half civilians, plus 20 civilians from the Facilities Unit. MDFR has no volunteer members. The Logistics Division runs drills to prepare for extended logistical support and has developed a "functional model" for these deployments (F. Fernandez, personal communication, December 22, 2010).

Schutz & Rettung Zürich (SRZ) assigns a "Logistikführung vor Ort" (logistics leader on site) to evaluate the situation, to determine the logistical needs, and to order the appropriate resources from the "Führung Rückwärtiger" (Base Command). Base Command manages (a) communications, (b) electronic real-time incident status display, (c) catering on site, and (d) logistics command. Logistics command is structured into different modules, such as facilities, transport, food, equipment, and fuel. The "Zentrale Logistik" (comparable to the RMD warehouse) is expected to step in with logistical support after 2 hours and left in charge after 3 hours of notification. For long duration incidents and special events, the SRZ can call up the City's civil defense logistics company. The 60 member strong civil defense unit is specialized in

logistical support and equipment servicing and repair. Each member has to serve at least five days per year in their capacity. The SRZ does not have a set plan for logistical deployments. Instead, the SRZ utilizes a set of planning scenarios that they work through to practice the process and to identify capabilities and shortfalls (W. Meierhofer, personal communication, January 3, 2011).

Chief Executive Officer Andrew Ford from the Volunteer Fire Brigades Victoria (VFBV), Australia, was quoted in an article that non-operational volunteers provide the support that "keeps local brigades going". Ford added that "these are ordinary Victorians who have made the commitment to do something for their community". Currently, in Victoria there is a statewide trend of increasing County Fire Authority (CFA) firefighter volunteers and an increasing number of them are becoming non-operational volunteers (Volunteer Fire Brigades Victoria [VFBV], 2010).

Prince Edward Island, Canada, Emergency Measures Organization (EMO) views volunteers as the "backbone" of the organization. The volunteers staff emergency operations centers and form logistics teams. As part of logistics teams, they function as runners, manage specific logistics assignments, monitor media reports, and "carry out a variety of operational and administrative duties". Additionally, during search and rescue incidents, they manage the logistical support for the whole operation (Latta, 2001, p. 11).

The U.S. Army has adopted the doctrine of modularity to provide extended logistical support. The Army states that logistical support has to be "versatile, deployable, and expandable" (Kibben, 1999, p. 1) The Army defines modularity in five principles. They are (a) modularity must be responsive, i.e., shorten the delivery time from the source to the user; (b) modularity has to be able to execute a mission on short notice; (c) modularity has to be economical with regard

to cost effectiveness and the use of resources (economics is achieved with the right balance of "forces and capabilities to accomplish their assigned mission for the duration of the operation"); (d) modularity must retain flexibility through diversification of functional capabilities (this allows for expansion or contraction "in anticipation of unanticipated mission requirements"); and (e) the principles of modularity must be consistent with the principles of army operations (p. 8-9).

In 2004, the Army started to adopt the Theater Sustainment Command (TSC) concept. The new modular structure orchestrates subordinate support units that are "tailored for the mission requirements of specific operations" from a central location. The TSC aims to "eliminate redundancy and to maximize flexibility" by circumventing unnecessary layers in the command structure (Task Force Logistics, 2004, ¶ 4). The Army is also looking at 'predictive technology" that shows where combat units are, assesses their operational environment, and predicts their logistical needs (¶ 9). The goal is to establish an "Amazon.com type of visibility" that shows the soldiers the status of their supply orders and a reliable time of delivery (¶ 10).

At the 2009 Presidential Inauguration, it was critical to the planning effort "to anticipate and plan for changes in requirements and tackle emerging needs to avoid unintended consequences" (Paone & Kossick, 2009, Defining Requirements section, ¶ 1). Paone & Kossick (2009) used the analogy "flexibility is the key to airpower" and argued that the same was true with logistics. Additionally, Paone & Kossick emphasized the importance of change management in logistics planning. A reliable mechanism is required to react to changes in demands and plans and then to communicate these changes to everybody who needs to know (Planning and Coordinating Support section, ¶ 2).

FEMA reorganized and elevated the logistics function from a branch to a directorate in

2007. The mission of the new Logistics Management Directorate (LMD) is to "plan, manage, and sustain the national logistics response and recovery operations response to domestic emergencies and special events" (OIG, 2010, p. 3). Since 2007, FEMA reassigned 15 headquarters positions to the field, almost tripled the permanent full-time logistics staff, and trained them in multiple areas (p. 5). In addition, FEMA introduced a credentialing plan to standardize the training, experience, and skill requirements for logistics personnel (p. 6).

In 2008, the Department of Homeland Security (DHS) adopted the National Response Framework (NRF) as a guide for effective all-hazards response. The NRF is "built upon scalable, flexible, and adaptable coordinating structures to align key roles and responsibilities…" (DHS, 2008, p. 1). The NRF applies NIMS to provide "a consistent template for managing incidents" (p. 1). One of the NIMS resource management principles, recommended in the NRF, is pre-scripted mission assignments. This concept facilitates not only response planning but also reduces the time it takes to deploy the response resources. Additionally, the pre-scripted mission assignments identify the resources and capabilities of other response organizations before they are called for assistance (p. 29).

Comparing the different mechanisms and concepts used by others to build and sustain extended logistical support provided the research project with new ideas for material and manpower resources and for logistical support strategies. Especially, learning from foreign organizations enriched the project with new, previously unexplored considerations. The Army's doctrine and the NRF structure and planning concepts were further sources that proved to be valuable in the development of the projects recommendation.

Research Question #5: What are available assets that could be utilized for extended logistical support?

The available assets are grouped into material and human capital assets.

Material Assets

In 2004, CFEMS purchased the Western Shelter System, composed of four 19 x 35 foot tents with lights and HVAC units. There are currently three tents left after one was destroyed during a thunderstorm. The shelter system is complemented with a water purification and distribution system, including field sinks and showers. The Western Shelter System is being housed at Fire Station #2. Part of it is being stored on a trailer, and part in a yard shed. Additionally, there are four portable generators. In 2010, a 36,000 Watt pull-behind WhisperWatt™ generator was added. All components of the Western Shelter System have been funded through grants (D. S. Parrott, personal communication, November 7, 2010).

The Office of Emergency Management owns a portable AM radio station on a trailer. The radio station has a 10 mile sender radius and runs on batteries. It has been used in the past to broadcast directions to and available parking at special events. The unit is being stored inside a hangar at the county airport (C. Nellis, personal communication, November 22, 2010).

Volunteer Company 13 Auxiliary utilizes a refurbished ambulance to transport food and drinks to the scene. The unit, called Rehab 13, is owned by CFEMS and stationed at Fire Station # 13 (J. E. Graham, personal communication, November 16, 2010).

In April 2009, RMD took ownership of a 4,419 sq ft, state-of-the-art warehouse (J. Tignor, personal communication, March 10, 2011). Additionally, the division owns a box delivery truck with hydraulic lift, a converted ambulance that serves as a delivery truck, a delivery van, 5 pickup trucks, and 6 staff cars (P. Smith, personal communication, March 10,

2011).

Human Capital Assets

Ms. Sherri Laffoon, emergency management assistant & CERT program coordinator,

stated that there were 394 trained CERT members as of November 2010. The team members are

composed of approximately 55% females and 45% males with an estimated average age of 48

years. CERT is mostly supported through grant funding from FEMA. The CERT training

consists of (a) disaster preparedness, (b) CERT organization and Incident Command System

(ICS), (c) disaster psychology, (d) medical operations, (e) light search and rescue, and (f) fire

safety and suppression. There are seven basic CERT classes scheduled for 2011. CERT members

are being utilized to staff information booths at fairs and other special events. In addition, they

serve in the Rapid Assessment Program (RAP) after a severe weather event to report damages in

their neighborhoods. Ms. Laffoon explained that "they [CERT members] could be doing more

and many have expressed interest in doing more". Ms. Laffoon added that she sees "some of

them as volunteers for the fire department in capacities other than firefighting" (S. A. Laffoon,

personal communication, November 29, 2010).

CFEMS Volunteer Coordinator David Tesh from the Volunteer Recruitment Unit

explained that "there are some logistics support volunteers in the system". He estimated that

there were about 20 and added that "no one has defined yet what they can and cannot do". Tesh

pointed out that "we seem to attract an older group to the non-operational volunteer role". The

younger volunteers, on the other hand, volunteer in that role until they qualify for fire training.

Tesh indicated that there was an interest from the CFEMS leadership to develop a cadre of

support volunteers to help in all areas of the department (D. Tesh, personal communication,

December 10, 2010).

In 2004, the Fire Corps program was launched by the National Volunteer Fire Council.

Fire Corps is a partner program under Citizen Corps. The goal is to support fire departments with

community volunteers, who can assist with non-operational tasks. The Fire Corps mission states,

"To enhance the ability of fire departments to utilize citizen advocates and provide individuals

with opportunities to support their local fire departments with their time and talent" (Collin

County Citizen Corps, n.d., ¶ 1). The Fire Corps concept is supported by the U.S. Fire

Administration and is funded through DHS and Citizen Corps (Fire Corps, n.d.a, ¶ 2). The Fire

Corps website lists 41 established Fire Corps programs in Virginia that are spread out throughout

the commonwealth (Fire Corps, n.d.a, Find a Program section).

The full-time members of CFEMS represent the bulk part of the organization's human

capital assets. It is 466 personnel strong. The majority (382) belong to the Emergency Operations

Division, followed by the Fire & Life Safety Division (21), the Personnel Management &

Development Division (17), the Budget & Planning Division (8), and the Resource Management

Division (8). The remaining 30 are divided among Executive Staff, Revenue Recovery,

Information Technology, Emergency Management, and EMS (T. Tucker, personal

communication, December 13, 2010). Appendix C displays the detailed break-down of CFEMS

personnel.

The inventory of existing and potential human resource and material assets was vital to

the project and revealed new opportunities and inspired new ideas. It proved to be essential to

know what assets were already or potentially accessible. This in return, helped shape the

project's recommendation.

In all, it proved to be effective to organize the literature review in the above order. The

five research questions functioned as building blocks that formed a solid foundation for the

research project to progress upon.

<div align="center">Procedures</div>

The research project followed the descriptive research method. The author conducted

some preliminary discussions with key stakeholders to ensure their buy-in and to learn their take

on the research problem before submitting the research proposal to the assigned evaluator.

Separate meetings took place with Deputy Chief of Emergency Operations Mark D. Sacra,

Deputy Chief of Management Services James E. Graham, Battalion Chief of Resource

Management Division David "Steve" Parrott, and Emergency Management Coordinator Curt

Nellis. Additionally, e-mail correspondence was initiated with Emergency Management

Assistant and CERT Program Coordinator Sherri A. Laffoon and CFEMS Volunteer Coordinator

David Tesh to introduce the research project and to obtain specific information. Appendix D lists

the main questions for Ms. Laffoon. Appendix E lists the main questions for Mr. Tesh. Both

provided great insights into their programs. The final interview was conducted with CFEMS Fire

Chief E.L. Senter to attain his perspective on the subject. This was the last interview and was

conducted late in the project on purpose. It had the benefit of being able to discuss some of the

findings from the surveys and the ideas they had generated. As the leader of the organization, it

was imperative to involve Chief Senter in the project and to incorporate his views.

CFEMS' Planning Unit was contacted with a request for data on long duration incidents

and special events. It was essential to the research project to know what the extent of long

duration incidents has been for CFEMS. The data provided by Data Analyst Jim Kelly showed

all calls for service in the Computer Aided Dispatch (CAD) database in six hour intervals. The

time intervals were measured from the dispatch time of the first unit until the last unit cleared

from the incident. Incidents that consisted of dispatching a tactical medic in support of a lengthy

law enforcement operation were not considered. Also, incidents, where a fire marshal cleared as

the last unit after an extensive investigation, were excluded. The exclusion of calls with these

variables avoided distortion of the data and ensured validity of the findings. The analysis of the

raw data from the Planning Unit provided the research project with a reliable and valid

quantitative measure of the number of long duration incidents and helped to demonstrate the

need for this research project (see Appendix B).

Western Shelter Systems in Eugene, Oregon, was contacted to obtain contact information

of an organization that was utilizing their system and was experienced in long duration

deployments. As a result of the inquiry, Team Leader Chris Starbuck from the NC-SMAT

contacted the author and offered his assistance with the research project. In Mr. Starbuck, the

author found a rich source of information about the team's deployment and sustainment

procedures.

While at the National Fire Academy (NFA), the author formulated the problem and the

purpose statements and developed the research questions. The author then approached the two

instructors, Commissioner Philip McLaughlin and Chief Roger McGary. Their critique helped to

better define the problem statement and provided invaluable guidance for the research approach.

Chief McGary also helped the author to get in touch with the logistics committee chair of the

NCR-MIT, Battalion Chief John Ahrens. E-mail correspondence was initiated with Chief Ahrens

to learn how the NCR-MIT deployed to disasters and handled extended logistical support. The

subsequent communications provided constructive information for the project.

The author learned that RMD Battalion Chief Parrott was attending the Logistics Section

Chief Training Class in Fairfax County, Virginia, at the same time the author was at the NFA.

This presented a unique opportunity to incorporate a group of subject matter experts from

different jurisdictions in Virginia and Maryland. Through Chief Parrott, the author asked the class if they would be willing to support the research project and participate in a survey. The class agreed in unison, and Chief Parrott provided the author with the class roster.

Also, while at the NFA, the author took full advantage of the Learning Resource Center (LRC) and initiated a topical literature review. This generated a wealth of information.

Upon completion of the EAFSOEM course, the author submitted the applied research proposal to the assigned evaluator for review and approval.

The author made a conscious effort to incorporate best practices and existing research from outside the fire service and field of emergency management. This approach led the project to studying CSS Deployed Logistics, a commercial provider of disaster response and special missions worldwide, as well as journals and research papers from the U.S. Army. Taking into account how the private industry and the military are managing logistical support benefited the research project with the opportunity to study sophisticated, tested methods. These logistical support methods have been developed by the business world. The ones adopted by the military, have been tested under the most difficult conditions in combat. The inclusion of a private corporation and the military widened the horizon for this research project from "Wall Street to the battlefield".

Furthermore, it was important to the author to enlarge the perimeter of the research further than the U.S. border, as not to restrict the options for solutions to what is known and familiar. Consequently, the research project explored and compared practices beyond what is accustomed to us inside the comfort zone of the United States. Besides analyzing existing research from Canada and Australia, the author initiated direct communications with Schutz & Rettung Zürich (SRZ), the career fire and EMS department for the city of Zurich in Switzerland.

The SRZ was chosen for its highly regarded reputation, not only within the Swiss fire service but across Western Europe. The author had to go through a formal process first to obtain permission for the requested information, in which the author introduced the research project and justified the purpose. The request was approved by the authorities and forwarded to the chief officer in charge of logistics and material assets. All communications were conducted in German and freely translated by the author. The cordial dialog that resulted enriched the project with fascinating, detailed first-hand information.

Miami-Dade Fire Rescue (MDFR) was contacted after the author learned from an EFO classmate of their extensive experience with large scale events, such as the Miami Dolphins football games, the Florida Marlins baseball games, the Miami-Dade County Fair and Expositions, NASCAR races, etc.

The Henrico (VA) Office of Emergency Management was contacted after a survey respondent stated that their jurisdiction had a plan in place for extended logistical support. As a result, the author was able to obtain an electronic copy of their plan for review.

In an effort to augment the information from the interviews, e-mail correspondence, and the literature review, two surveys were developed on SurveyMonkey.com©. The survey questions were designed with the research questions in mind. The questions consisted of open-ended, closed-ended, and forced choice questions. The majority of questions were designed as forced choice questions to achieve uniformity of results and ease of analysis between the two surveys. A purposeful effort was made to keep both surveys short and succinct.

The first survey was designed for the CFEMS organization and was identified as *internal survey*. The total population for the internal survey was 466, the total number of CFEMS members. The criteria for selecting the sample group were level of decision making, level of

experience in logistical support, and level of involvement in long duration incidents or special

events. The selection of the sample group resulted in 40 members, representing Chief Officers,

EM staff, volunteer leaders, specialty team leaders, and RMD staff. Appendix F illustrates the

detailed composition of the sample group. The draft survey was reviewed and tested on

December 30, 2010, by a civilian, non-fire service related professional and a chief officer, who is

an EFO graduate. Their comments assisted the author in developing clear and concise questions.

The revision was completed on January 9, 2011, and the final survey was e-mailed to the sample

group the same day. Appendix G lists the finalized survey questions for the internal survey.

The purpose of the second survey was to collect data from fire departments and

emergency management organizations outside Chesterfield County. This survey was identified

as the *external survey*. The total population for this survey was viewed to be the members of the

U.S. fire service and field of emergency management. In order to objectively represent the total

population, the author identified three separate groups to form the survey sample. The sample

population was made up of subject matter experts and future fire service leaders from a variety of

jurisdictions. Appendix H displays the detailed makeup of the survey sample.

The first group consisted of the 9 members of the December 2010 Logistics Section Chief

Training Class in Fairfax County, Virginia. The second group was made up of the 17 members of

the Virginia Fire Chiefs Resource Management Group, a subcommittee of the Virginia Fire

Chiefs Association. The 19 classmates of the December 2010 EAFSOEM class formed the third

group. The author felt that the three groups with a total of 45 respondents represented a valid

sample population.

The draft survey was reviewed and tested by the same civilian, non-fire service related

professional and by the RMD battalion chief on December 30, 2010. In response to their

feedback, the author, again, refined some of the questions and answer choices to avoid biased

questions that would distort the results. The external survey was finalized on January 9, 2011,

and e-mailed to the survey respondents the same day. Appendix I illustrates the finalized

research questions for the external survey. Both surveys were closed after three weeks on

January 30, 2011.

Limitations and Assumptions

Some of the considered research from the military was older than five years. Due to the

exceptional quality of the research and the concepts described, the author decided that the

findings were still valid and worthy of consideration. Furthermore, the study of private industry

resources was limited to CSS Deployed Logistics. The author regarded the company's size and

extensive involvement in disaster response and special missions as representative of logistical

support in the private industry.

The communications with SRZ in Switzerland occurred in a foreign language. The

obtained information was elaborate and in great detail. It should be pointed out that all

information was freely translated by the author.

A limitation of the internal survey was the missing identification by work assignment of

the respondents. It would have been helpful to see the variation of responses among the different

divisions and between the career and volunteer leadership.

A limitation of the external survey was the limited demographic breakdown of the

respondents. It would have made interpretation of the data more accurate to consider the number

of logistics personnel in proportion to operational personnel, budget of the department, call

volume, and size and make-up of the jurisdiction. Additionally, the author assumed that the

subject matter experts from the NCR-Logistics Section Chief Class and from the Virginia Fire

Chiefs Association were a valid representation of the U.S. fire service. The author also assumed that all 19 members of the December 2010 EOFSOEM class are going to successfully complete the EFO program and to continue their career path to become fire service leaders.

Definition of Terms

For the purpose of this research project, the designation *long duration incidents* refers to all-hazards incidents that extend beyond the initial operational period. The term *special events* refers to large scale events, such as county fairs, athletic competitions, large scale exercises, etc. The word *assets* reflects human capital and material assets. Western Shelter is a brand name of emergency shelters and shelter accessories. It is manufactured and distributed by Western Shelter Systems out of Eugene, Oregon.

Results

Research Question #1: What is needed to provide extended logistical support?

Commercial providers of extended logistical support advertise a variety of services and products. They include (a) command center and office units; (b) housing, food, and laundry service; (c) medical units; (d) shower and latrine units; (e) potable, grey and black water storage, water treatment, and plumbing systems; (f) dry and cold storage units; and (g) fuel and power supply.

Large scale special events, e.g., the 2009 Presidential Inauguration, identified an extensive need for (a) meal service, (b) transportation of personnel and equipment, (c) traffic control supplies, and (d) furnishings for workstations and sleeping quarters.

Emergency response teams, e.g., SMATs and IMTs, utilize comprehensive shelter systems with accessories (water, power, HVAC, lighting, etc.) to set up their own infrastructure and logistical support. A commonly utilized shelter system is the Western Shelter System.

Other U.S. and foreign fire departments possess (a) tents for shelter with accessories; (b) generators; (c) meal service; (d) trained logistics staff, including technical support technicians and mechanics; (e) fuel dispersing; (f) vehicles to transport personnel, supplies, and equipment; (g) mobile and independent command centers; and (h) medical stations.

The 40 members that made up the sample group for the internal survey (N=40) produced 19 replies (n=19). The detailed replies to each question in the internal survey are displayed in Appendix J.

The first question in the internal survey asked CFEMS members what was needed to provide extended logistical support at long duration incidents or special events. The majority (94.7%) selected "rehab unit for food and drink", followed by "manpower trained at performing logistical tasks" and "sanitation equipment (toilets, field sinks, showers, etc.)", both 84.2%. The selection for "tents (for work, rest, or storage area, etc.)" ranked third with 78.9%, ahead of "logistics plan or procedure" with 73.7% and "power generators" with 57.9%.

The 45 members that formed the sample group for the external survey (N=45) generated 17 replies (n=17). The detailed answers to each question in the external survey are cataloged in Appendix K.

The external survey started with the same first question. All of the respondents from other departments (100%) selected "logistics plan or procedure" as their first choice. Second choice was "manpower trained at performing logistical tasks" with 88.2%, followed by "rehab unit for food and drink" and "sanitation equipment" with 82.4% each. The selection for "tents" was fourth with 70.6% and "power generators" was fifth with 52.9%.

The second survey question in both surveys was the same and intended to qualitatively measure the need for being able to extend logistical support. The majority of CFEMS

respondents (47.4%) chose "identified as a weakness and should be addressed as soon as possible", ahead of "insufficient" (26.3%). Two respondents (10.5%) picked "sufficient".

The greater part of respondents from the external survey (47.1%) selected "sufficient", ahead of "insufficient" (23.5%), "non-existent", and "identified as a weakness but unable to address at this time" (11.8% each).

Research Question #2: What are the problems with extended logistical support?

The common problems identified during the literature review included (a) lack of manpower; (b) deficient mobilization and demobilization process; (c) not following plans, policies, or procedures; (d) inadequate technical support; (e) validating requests and obtaining proper approvals; (f) identifying needs and prioritizing allocation of resources; and (g) overwhelming magnitude of needs.

There were three main problem areas identified by the interviewed subject matter experts and key stakeholders. The first problem was the lack of manpower resources to deploy the material assets to where they were needed. The second problem was building an effective command structure that would support the extended logistical operation. The third problem was the lack of coordination at getting the material assets to the scene.

The third survey question in both surveys asked the respondents, what the most common logistics problems were at long duration incidents or special events that they had been experiencing. Most of the CFEMS respondents chose "lack of manpower" (73.7%), followed by "activation and deployment procedure" (68.4%) and "roles and responsibilities not specified" (52.6%).

The respondents from the external survey selected "no logistics plan or procedure in place" and "roles and responsibilities not specified" (52.9% each) as a common problem. The

second most common problems stated were "availability of appropriate equipment" and "did not

know what assets were available" (47.1% each). "Lack of manpower" was the third most

common problem stated (41.2%).

Research Question #3: How does the CFEMS organization believe extended logistical support

should be managed?

The main ideas captured from key stakeholders of how extended logistical support should

be managed were (a) implementing a taskforce concept; (b) utilizing the RMD staff as the core

team that is complemented by CERT members, other volunteers, and personnel from other

divisions; (c) adopting the NIMS organizational chart for Logistics Section Chief; (d) training

personnel in different specialties; (e) building on past experiences; (f) defining the capabilities of

resources and agreed expectations; (g) following the PDSA Cycle for implementation; (h) using

EM as orchestrator of resources; and (i) storing the material assets at two different fire stations

and training station personnel at both stations.

The statement in survey question #4 in the internal survey explored how CFEMS

members valued effective logistical support to front-line resources. The statement read, "In your

opinion, the value of effective logistical support to front-line resources increases proportionally

to the length of time of an operation". The majority indicated that they agreed (47.4%) or even

agreed strongly (36.8%). Two respondents opted for "don't know" and one for "disagree". For

comparison, the same question was asked in the external survey (survey question #9). The

respondents from other departments selected "agree" (58.8%) ahead of "strongly agree" (41.2%).

Survey question #5 in the internal survey was a follow-up question that explored how

important the ability to provide extended logistical support was. The vast majority selected

"critical for a successful outcome" (78.9%) and the remaining respondents chose "nice to have

but not critical to the outcome" (21.1%). None of the respondents claimed that extended

logistical support was not needed. The respondents from the external sample group were asked

the same question (survey question #8) for comparison. The vast majority of external

respondents (94.1%) indicated "critical for a successful outcome" and one respondent (5.9%)

stated "nice to have but not critical to the outcome". No one claimed "not needed".

Survey question #6 in the internal survey asked to whom extended logistical support

should be assigned to. Most of the respondents identified "Resource Management Division"

(68.4%) to be best suited to take ownership, ahead of "Emergency Operations Division"

(10.5%). One respondent clarified that "RMD should have the lead with support from Ops". One

respondent selected "Emergency Management" and two respondents did not specify a single

entity.

Research Question #4: How do other organizations manage extended logistical support?

The literature review revealed a variety of methods to extend logistical support. Some fire

departments utilize non-operational volunteers from their own community, e.g., Fire Corps, as a

source of manpower to extend their logistical needs. Others rely on their own logistics personnel

or assign operational personnel to logistics functions.

The resource and logistics management plan from the Henrico Office of Emergency

Management mandates all county departments to identify the resources needed in their functional

area to sustain their operations. While the responsibility lies with the individual county

department, the fire chief oversees resource management during a disaster.

Emergency response teams depend on being self-sufficient and, for that reason, cross-

train their members in logistical functions. The NC-SMAT, consists of a small full-time staff and

activates team members, who are all volunteer personnel, as needed for a specific mission. The

teams have identified logistics experts who oversee the rest of the team during logistical operations. The teams rely also on their own logistics experts when local fire departments on site assist with set-up or demobilization of material assets, e.g., tents, etc.

Larger departments with frequent exposure to large scale events, such as MDFR, possess the appropriate material and human capital assets to extend their logistical support. MDFR has a plan for extended logistical support and practices it with deployment drills throughout the year. The Logistics Division consists of 125 full-time positions. Half of the logistics staff is career and half are civilian employees. In addition, the Logistics Division can pull 20 more civilian employees from the Facilities Unit for assistance. Staffing of operational personnel and equipment needs for the safety of the event is orchestrated by the Special Events Bureau within MDFR.

SRZ assigns a logistics leader on site to a large scale incident or event. This person evaluates the situation, identifies the logistical needs, and orders the appropriate resources from Logistics Command. The "Zentrale Logistik" (comparable to the RMD warehouse) is expected to step in with logistical support after 2 hours and left in charge after 3 hours of notification. If SRZ manpower resources are exhausted, the department can activate the City's civil defense logistics company. The 60 members of the civil defense logistics unit are skilled in logistical support and equipment repair and servicing. Members of this unit have to serve 5 days per year in their capacity. SRZ does not have a formal plan to extend logistical operations. Instead, the department utilizes a set of planning scenarios to develop and maintain proficiency at logistical operations and to identify capabilities and shortcomings.

Local fire brigades in Australia and Emergency Measures Organizations (EMOs) in Canada rely heavily on non-operational volunteers to sustain long duration incidents and events

with logistical support. These non-operational volunteers not only fill logistical support roles but also take on administrative and managerial positions.

The U.S. Army has adopted a new modular structure, called Theater Sustainment Command (TSC). The TSC forms support units with capabilities based on the identified needs required to accomplish a specific mission. The TSC then orchestrates these subordinate support units from a central location without having to go through multiple layers of approval. This concept allows the Army to streamline the logistical support process and to accomplish efficiency and flexibility. Furthermore, the Army is probing with technology that can identify where units are, evaluate their operational environment, and consequently predict their logistical needs.

Logistical support for the 2009 Presidential Inauguration identified flexibility as a prerequisite for effective logistical support. It showed that high flexibility was maintained through continuously predicting needs, quickly adapting the logistics plan, and effectively communicating changes to all involved.

FEMA created the Logistics Management Directorate (LMD) to manage logistics at the directorate instead of the former branch level. The elevated position in the organizational structure provides FEMA logistics with the authority to make decisions more effectively. The LMD plans, manages, and sustains large scale logistical support. In addition to tripling the full-time logistics staff, FEMA has the option to call on hundreds of Cadre of On-call Response Employees (COREs) to supplement logistical support with more manpower. Furthermore, FEMA moved 15 headquarter positions to field offices, where they are more effective. In addition to formal training in various disciplines, FEMA launched a credentialing plan to standardize training, experience, and skill requirements for its logistics personnel.

The Department of Homeland Security counts on the National Response Framework (NRF) to successfully manage large scale, all-hazards responses. The NRF is a useful tool because its structures within the framework are scalable, flexible, and adaptable and can be implemented to fit the situation. Besides its pliability, the NRF aligns the structures with the appropriate roles and responsibilities. One of the NIMS resource management principles promoted in the NRF is pre-scripted mission assignments as a method to help with planning and expediting logistical support assets. Pre-scripted mission assignments also identify the resources and capabilities of other response organizations before they are needed.

Survey question #4 in the external survey explored what material assets other organizations own to provide extended logistical support. Power generators were identified as the most common asset (70.6%), followed by tents (47.1%), rehab unit for food and drink (41.2%), and sanitation equipment (29.4%). Less than half of departments represented (47.1%) stated that they had manpower identified for this purpose. The remaining responses and the comments given under "other" are listed in Appendix K.

Survey question #5 in the external survey looked at personnel resources other organizations utilized to assist with extended logistical support. The vast majority of respondents (76.5%) indicated "call-back/hire-back operational personnel", followed by "civilian employees within the organization" (41.2%), "operational fire or EMS volunteers" and "civilian employees from other government departments" (35.3% each), and "Community Emergency Response Team (CERT) members (29.4%). All other responses and the comments stated under "other" are listed in Appendix K.

Survey question #6 in the external survey asked the respondents if their organization had a written plan or procedure in place for extended logistical support. The majority (70.6%) replied

with "no". Five respondents (29.4%) claimed to have a plan or procedure in place.

Survey question #7 in the external survey referenced back to survey question #6 and asked the respondents who answered "yes" and were willing to share their plan or procedure, to leave their contact information. Three respondents left a comment. The first respondent left contact information, which produced the copy of the *2009 Henrico County (VA) Emergency Support Function #7 Resource & Logistics Management Plan*. Subsequently, the author included the document in the literature review. Another respondent stated that it [logistics plan or procedure] followed the *Firescope* guide. The third comment led to the telephone conversation with MDFR's logistics chief, which was discussed in the literature review.

The closing question in the external survey asked the respondents about the size of the organization. Of all the departments represented in the sample group, 47.1% were smaller, 41.2% about the same size, and 11.8% were larger than CFEMS.

Research Question #5: What are available assets that could be utilized for extended logistical support?

The findings from research question #5 are organized into material assets and human capital assets.

Material Assets

CFEMS has three 19 x 35 foot Western Shelter System tents and the appropriate shelter accessories. The shelter accessories consist of (a) lights and HVAC units for the tents, (b) water purification and distribution system with field sinks and showers, and (c) four portable generators. Two of the tents are loaded onto a trailer. The third tent and the accessories are stored in an outdoor shed. A 36,000 Watt pull-behind WhisperWatt™ generator complements the power supply for the shelter system. A further asset available is the portable AM radio station on

a trailer that is being stored at the county airport. The radio station is battery powered and has a

10 mile sender radius. Another asset available is the refurbished ambulance that has been turned

into a food and drink unit. The unit is called Rehab 13 and is being used by volunteers of the

Volunteer Company 13 Auxiliary. The RMD owns a new, state-of-the-art 4,419 sq ft warehouse

that facilitates the stockpiling and organizing of supplies. Furthermore, RMD possesses two

delivery trucks (one is equipped with a hydraulic lift), a delivery van, 5 pickup trucks, and 6 staff

cars.

Survey question #7 in the internal survey asked the CFEMS sample group what material

assets could be utilized for extended logistical support. Seven respondents skipped the question

and 12 respondents left comments and a total of 23 descriptions of assets (n=23). The Western

Shelter System, including tents, accessories, and generators was mentioned seven times (30%).

The Resource Management Division (RMD), including their personnel and vehicles, was listed

six times (26%), followed by three references (13%) to Rehab 13. Two comments (9% each)

referred to the need for manpower and to the Mobil Command Center (MCC). Individual

comments (4% each) were made in reference to (a) the air utility unit with SCBA fill station, (b)

the Polaris ATV, and (c) a designated rehab unit. The answers are displayed in their entirety in

Appendix J.

Human Capital Assets

The Chesterfield CERT program presents a pool of almost 400 community volunteers.

The estimated average age of the members is 48 years. The gender is roughly divided between

55% females and 45% males. The CERT members have gone through formal basic training,

including preparedness and ICS. CERT members assist special events with staffing information

booths, but the members are capable and willing to do more. The CERT program coordinator is

receptive to the idea to expand the role of CERT members to non-operational support within CFEMS.

There are an estimated 20 logistics support volunteers with CFEMS. The department appears to attract older citizens to become non-operational volunteers. At the time of this writing, their roles have not been defined and, as a result, these non-operational volunteers are not utilized effectively. There is an interest in developing a cadre of support volunteers in all areas of the organization.

The Fire Corps concept promotes the idea of organizing support from the community to assist their local fire department with non-operational task. The Fire Corps concept is still fairly new but has proven to be an effective method to find volunteer resources from within the community. There are 41 existing Fire Corps programs in Virginia, including the neighboring jurisdictions (a) Richmond Fire and Emergency Services, (b) Goochland Fire-Rescue, (c) Hanover Fire and EMS, and (d) Henrico County Division of Fire.

CFEMS' full-time human capital amounts to 466 personnel. The majority of personnel are assigned to the Emergency Operations Division (82%), followed by the Fire & Life Safety Division (4.5%), the Personnel Management & Development Division (3.7%), the Budget & Planning Division and the Resource Management Division (1.7% each). Executive Staff, Revenue Recovery, Information Technology, Emergency Management, and EMS make up the balance (6.4%). Appendix C displays the detailed breakdown of CFEMS personnel.

Survey question #8 in the internal survey focused on potential sources of manpower. The question asked what manpower resource(s) should be utilized to assist with extended logistical support. The greater part of the respondents (89.5%) indicated "personnel assigned to the Resource Management Division" ahead of "CERT members" (78.9%). There were four other

potential sources identified with an equal number of selections (63.2% each). They were (a) "operational CFEMS volunteers", (b) "non-operational CFEMS volunteers", (c) "civilian employees within the organization", and (d) "call-back/hire-back operational personnel". Appendix J displays the remaining selections and the comments given under "other".

Survey question #9 in the internal survey invited the CFEMS respondents to leave additional comments. Four respondents took advantage of the opportunity and elaborated on the subject. The first comment was in response to survey question #4. The respondent stated that extended logistical support was not directly proportional to the duration of an incident. He/she added that it expanded rapidly during the first operational periods but then reached a point where it did not expand any further and stagnated until demobilization of the operation. The second comment was in response to survey question #5 and pointed out the necessity to perform a needs assessment, to develop a project plan, and to allocate resources accordingly. The third comment referenced survey question #6 and stated that Operations would have to manage the extended logistics function until there was a "dedicated vehicle to support rehab and extended operations". The fourth comment was a recommendation to save cost by hiring volunteers with "departmental operations knowledge" instead of hire-back personnel. All comments are displayed in full in Appendix J.

Discussion

Research Question #1: What is needed to provide extended logistical support?

The objective of the first research question was to identify the resources required to make extended logistical support possible. The research project purposely looked beyond the U.S. fire service and incorporated the private industry, a recent large scale special event, and foreign emergency response organizations to pinpoint the necessities.

It was interesting to look at the private industry to see what logistical support services they market and then to compare these services with the logistical needs of a large scale event, emergency response teams, and also with the needs identified in the surveys. It was not surprising from a business perspective to learn that services offered by the private industry matched services needed by emergency services at long duration incidents and special events. This, in return, helped substantiate what is truly needed to provide extended logistical support. In essence, the common denominators were (a) nourishment, (b) sanitation, (c) shelter, (d) transport, (e) manpower, (f) fuel and power supply, and (g) a plan. There is no specific order of priority, even though nourishment was frequently mentioned first. But, for the most part, the seven components are interrelated and in support of each other. For instance, meal service in the field cannot be provided, unless food and drink can be transported to the location by available personnel, served in a sheltered environment with power supply and the necessary sanitary infrastructure, and executed by a functional plan.

Both surveys asked their respondents what was needed to provide extended logistical support. The results were interesting for two reasons. First, both sample groups selected the same top five resources. Although, the order of choices varied between the two surveys, they were comparably close. The sample group from the external survey unanimously selected "logistics plan or procedure" as their first choice. The author reasons this response due to the background of the members in the sample group, which had a strong representation of chief officers and logistics planners. These individuals are either engaged in or constantly exposed to planning processes and, therefore, are familiar with the benefits of having a logistics plan or procedure.

The sample group from the internal survey, on the other hand, had a strong representation of operational practitioners from the field. This explains their first selection for food and drink,

which is a more observable need with imminent benefits, as opposed to plans or procedures.

The second reason that made the results from the surveys remarkable was the discovery that all the top choices fit in one of the seven components identified during the literature review. The comparison of existing and original data from this research project, substantiates the argument that there are seven components needed to provide extended logistical support. The author's interpretation of these findings inspired the concept of the *7 Pillars of Extended Logistical Support.*

Figure 1 illustrates graphically the concept of the 7 Pillars of Extended Logistical Support. The concept learned from the research findings suggests that the identified components (pillars), built on preparedness as its firm foundation, are able to carry the weight of sustainability of a long duration incident or special event.

Figure 1. The 7 Pillars of Extended Logistical Support
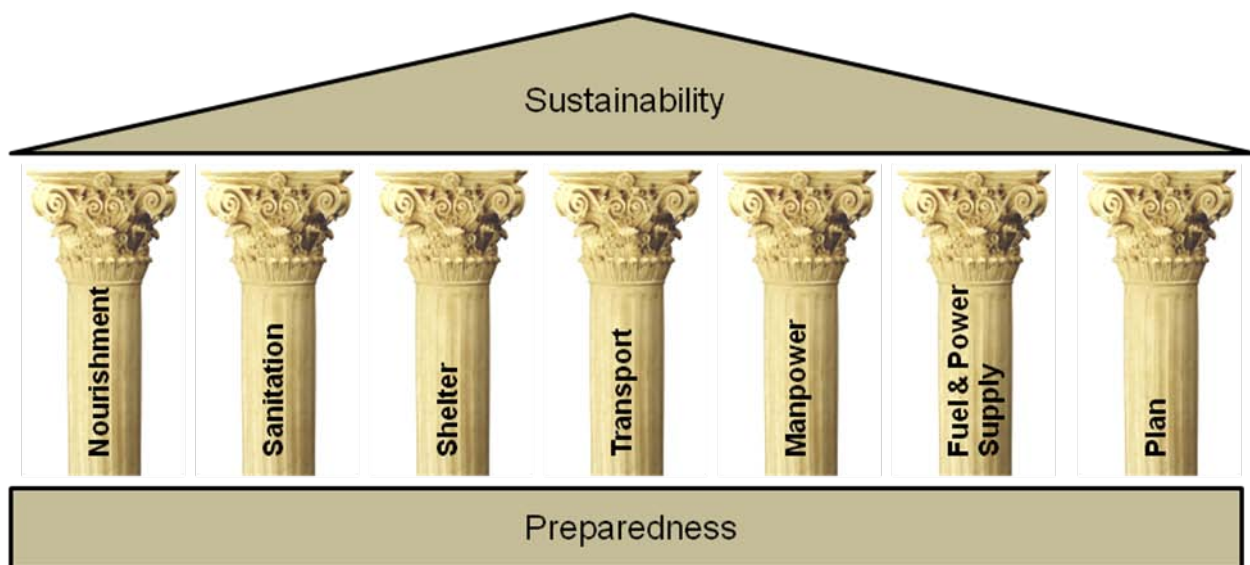
Source: Author, 2011

The second survey question in both surveys was the same and intended to qualitatively measure the need for being able to extend logistical support. While almost half of the respondents in the external survey assessed extended logistical support to front-line resources as sufficient, the vast majority of CFEMS members in the internal survey stated that it was identified as a weakness, insufficient, or even non-existent. Nearly half of the CFEMS respondents indicated that this identified weakness should be addressed as soon as possible. The responses from the CFEMS sample group in the follow-up question conveyed acknowledgement of the problem and a "sense of urgency". This was in contrast to the respondents from the external survey, who appeared more optimistic.

Research Question #2: What are the problems with extended logistical support?

The intention of the second research question was to clearly understand the root of the problem and then to identify the obstacles that the project's recommended method had to be able to overcome. The interviews and correspondence with subject matter experts brought to light a multitude of problems. Further evaluation of the stated problems suggests that the majority of problems are either planning or manpower related. It was interesting to learn that concerns with planning and manpower overshadowed concerns with obtaining appropriate material assets.

Survey question #3 in both surveys was designed to support this research question when both sample groups were asked what the most common logistics problems were. The results from the CFEMS sample group pinpointed the same two core problems, manpower and planning. There was less emphasis on problems with getting appropriate material assets to the scene. This can be explained by CFEMS' unique situation where there are material assets available but there are no assigned personnel and no formal procedures with identified roles and responsibilities to deploy and manage these assets.

The problems stated in the external survey were comparable. Even though the respondents from other departments expressed concerns about not having a plan or procedure and unspecified roles and responsibilities, there were noticeable concerns about material assets. The respondents stated problems with obtaining appropriate equipment and with knowing what assets there were available. This was an evident disparity between the two sample groups and valuable to know for the recommendation.

Based on the findings from research question #2, the author concluded that CFEMS' core problem with extended logistical support lies in planning and personnel. The author argues that all other identified problems can be managed by addressing the need for planning and personnel, including procedures, roles and responsibilities, and training. These findings became instrumental in developing the project's recommendation.

Research Question #3: How does the CFEMS organization believe extended logistical support should be managed?

It proved to be advantageous for the research project to identify and engage the key stakeholders within CFEMS. This strategy enriched the project not only with the stakeholders' buy-in but also with their perspectives and ideas. The beliefs how extended logistical support should be managed varied greatly. The spectrum of beliefs encompassed emphasis on organizational structure, process management, past experiences and lessons learned, operational strategies, regional cooperation, and on opportunities to expand and enhance existing programs.

Survey questions #4, #5, and #6 in the internal survey were designed to expand the spectrum of beliefs to the rest of the organization and to explore how important it was to the members. Survey questions #8 and #9 in the external survey served as comparison with other organizations.

The concept stated in survey question #4 served as a qualitative measure of how the organization valued logistical support at long duration incidents and special events. The same concept was stated to the external sample group for comparison. It was not surprising to see the unanimous agreement among the respondents from the external survey. By inference, the result expressed an undivided appreciation for logistical support, which was to be expected from the sample group with strong logistical expertise and involvement. Even though the results from the CFEMS sample group was not unanimous, it was encouraging to see that the majority agreed with the concept and, by inference, valued the ability to extend logistical support.

Survey question #5 in the internal survey was a more direct approach to measure how the organization viewed the ability to provide extended logistical support. Survey question #8 was the equivalent question in the external survey. As expected, the sample group from the external survey was in strong support that extended logistical support was critical for a successful outcome. Although the results from the CFEMS respondents were more conservative, it was reaffirming to see that the majority thought it was critical to the successful outcome and, more importantly, no one claimed that extended logistical support was not needed. This was encouraging to the author.

Survey question #6 in the internal survey was a delicate but important question. The purpose was to find out what division or unit would be best suited to assume ownership and be in charge of extended logistical support. Traditionally, Operations has been handling the bulk part of extended logistical support. The results, however, suggested RMD to be better suited for the lead role. The author suspects that the recent appointment of a new division head for RMD may have been regarded by many as an opportunity for RMD to assume this responsibility. The results also suggest that a great number of respondents view logistical support not to be an

operational but a resource management function.

The findings from the surveys, combined with the perspectives from the interviews, were instrumental in moving this project ahead in a direction that would promise acceptance and appreciation by the organization. The findings also provided reassurance to the author that the research problem was important to the organization.

Research Question #4: How do other organizations manage extended logistical support?

Looking at other organizations to learn how they managed extended logistical support was of essence to the research project. The broad selection of organizations generated the desired variety of methods and concepts for comparison and evaluation.

The study of advertised logistical support services by the private industry enlightened the author with a business perspective of the subject matter. This was beneficial for two reasons. First, it revealed the type of support services offered in response to demand. Second, it allowed a glimpse at their organizational structure and operational model. The profit driven approach to logistical support is in contrast to the public service ideology. Nonetheless, the author argues that there is great value in looking at business models for opportunities to improve economics in the public sector. For this reason, the author made a deliberate decision to incorporate findings from the private industry in the project's recommendation.

One of the first concepts reviewed was Fire Corps. CFEMS has not experimented with Fire Corps but has experience with the closely related CERT program. Fire Corps' idea of recruiting community members to augment the capacity of their local fire department was intriguing to the author and became part of his vision for a solution to the research problem.

The ESF #7 Resource and Logistics Management Plan from Henrico County was remarkable. The author liked how the plan laid out the expectations, responsibilities, and who

was ultimately in charge. These are fundamental components of resource management to avert

misunderstandings down the road and needed to be integrated into the project's recommendation.

The insights gained from the NC-SMAT, NCR-IMT, MDFR, and SRZ were invaluable.

Their effectiveness depends on their efficiency. This concept was inspiring to the author. It

exemplified what can be accomplished by having the right material assets in place with a

rehearsed plan and the appropriate manpower for implementation. It was fascinating to learn how

they all had different methodologies to provide logistical support. The emergency response

teams strive to be autonomous and self-sufficient, while larger departments are more likely to

build up logistical support from an assortment of equipment and personnel. The dialogue with

SRZ proved to be a highlight during the research project and showed the author yet another

method. The SRZ concept was captivating because their focus is on being proficient at planning

for a variety of situations as opposed to a focus on formulating a planning document. The SRZ's

emphasis is on speed and resourcefulness. This is achieved by having direct lines of

communication and layers of resources that can be mobilized as needed. It was interesting to see

the high level of accountability for logistics personnel and the strict time lines for having a

sustainable logistical support established.

The study of organizations beyond the U.S. border continued to benefit the research

throughout the project. The organizational impact that non-operational volunteers have in

Canada and Australia was amazing to the author. Especially, the well accepted and appreciated

role of non-operational volunteers supporting front-line operations was intriguing and stimulated

ideas for the project's recommendation.

The author wanted to look at the military to study their logistical support concepts

because their work environment is comparable to the fire service. Both, the fire service and the

military, operate in an unforgiving and time sensitive environment where the success of a

mission essentially depends on logistical support. The author was fascinated by the principle of

modularity as applied by the military and decided that it needed to be a key characteristic in the

recommended method for CFEMS.

The experiences from army logisticians during the 2009 Presidential Inauguration

reiterated the value of flexibility, predictability, and adaptability. The author believes that these

characteristics are requisite for sustainable logistical support. As a result, they markedly affected

the design of the project's recommendation.

The examination of the NRF revealed further characteristics that the author considered to

be vital for CFEMS' logistical support method. Specifically, the concept of having a consistent

template in the form of a framework that allows room for flexibility, as opposed to detailed and

rigid instructions, appealed to the author. Furthermore, the concepts of scalability, coordinating

structures that align roles and responsibilities, and pre-scripted mission assignments were

inspirational to the author.

The respondents from the external survey also contributed valuable information to

research question #4. The last question in the external survey asked the respondents about the

size of their department. Knowing the percentages of represented departments that were

noticeably smaller, about the same, or obviously larger than CFEMS, was helpful with the

interpretation of the survey results. The author was glad to see that only a small percentage of

respondents came from larger departments that, by inference, are more likely to have abundant

resources to easily extend logistical support. Same size or smaller departments, on the other

hand, are more likely to be faced with comparable or more difficult obstacles to build up

logistical support and are easier to identify with. The high percentage of equal size or smaller

size departments represented in the external survey explains the results from survey question #4. Less than half of respondents stated that they had manpower identified for extended logistical support and owned a rehab unit, tents, or sanitation equipment. This was sobering to the author. Only the high percentage for power generators was within the range of expectations. The findings suggest that the majority of departments rely on outside help for material assets to extend logistical support.

Survey question #5 in the external survey was also worrisome. The results exposed a high dependency on call-back/hire-back operational personnel and a low utilization of volunteers for assistance with extended logistical support. The results show that there are a large number of unexplored and underused human assets from within their own communities that could be used.

Survey question #6 painted an unexpected picture as well. Considering the high representation of respondents who are heavily engaged in or exposed to logistics, the author anticipated the majority of respondents to have a written plan or procedure for extended logistical support. Instead, the replies revealed the opposite. In the follow-up question, respondents, who replied in the affirmative and were willing to share their plan or procedure, were asked to leave contact information for the author to get in touch with them. Among the respondents who left their contact information, only one produced a formal plan to the research project. The author was hoping to gather a selection of written plans and procedures for evaluation and comparison. Instead, it became evident that written plans or procedures for extended logistical support are a widespread deficiency in the fire service. This realization, however, substantiated the need for this research project and generated further incentive to develop a methodology that meets the needs of CFEMS but also benefits other departments.

Research Question #5: What are available assets that could be utilized for extended logistical

support?

The purpose of the last research question was to inventory existing and potential

resources within CFEMS that could support the project's recommendation. The results unveiled

an interesting find. It appears that CFEMS is in the advantageous position of already owning

material assets that could be appropriated to extended logistical support. In particular, the

Western Shelter System with its tents and shelter accessories could be utilized for this purpose. It

was not surprising that the Western Shelter System, or a component of it, was referenced the

most often by the CFEMS sample group in survey question #7. RMD personnel and vehicles

were the second most often mentioned asset. This, however, should be interpreted with caution

because it suggests the misperception that the RMD warehouse is fully stocked with all essentials

all year round and deployable on call. This is contrary to reality. RMD has neither the

appropriate stockpiles ready for deployment, nor the necessary manpower to deploy them.

Another interesting find was the low number of references to Rehab 13 as a resource for food

and drink. This suggests that the volunteer unit's capability, availability, and dependability are

not well known to the organization and its role not well understood.

It was interesting to see the high percentage of selection for RMD personnel as a resource

for manpower in survey question #8. Similarly to the suggestion to utilize assets within RMD in

the preceding question, CFEMS tends to overestimate RMD as a resource for manpower. It is

doubtful that RMD's lean staffing level could be further stretched to support an extended

logistical support operation. On the other hand, the second highest percentage for CERT

members as a resource for manpower came as an unexpected surprise. A new CERT program

coordinator and recent increased efforts to promote CERT activities and accomplishments in the

inter-departmental media is likely to have contributed to the heightened awareness and

credibility for CERT. The high selections for operational and non-operational volunteers were as

expected. CFEMS is a combination department and volunteers have been an important part of its

organizational culture. The level of recommendation to utilize civilian employees within the

organization was not expected. But, it suggests that the organization is considering non-

traditional sources for logistical support. This was a positive find.

  In all, the inventory of material and personnel resources had an encouraging effect on the

project. Based on the findings, the author was optimistic about being able to develop a

recommendation that was reasonable, based on data, and, therefore, defendable.

<div align="center">Recommendations</div>

  The project has unveiled two evident strong points for CFEMS that present exceptional

opportunities to realistically implement a method to extend logistical support for long duration

incidents and special events. The first strong point is CFEMS' inventory of appropriate material

assets that are available to be utilized. The second strong point is CFEMS' familiarity with

community volunteers as a manpower resource. Both strong points combined put CFEMS at a

definite vantage point to successfully implement these recommendations.

  In the short-term, the project has three fundamental recommendations. First, the project

recommends assembling the identified material assets at a central location. The cache of assets

includes the rehabilitation unit for food and drink, the Western Shelter System with all

accessories, the portable and pull-behind generators, the AM radio station, the air utility unit, the

MCC, the Polaris ATV, and the RMD fleet of transport vehicles. These assets are currently

spread out at different fire stations and other county facilities. The new, state-of-the-art RMD

logistics warehouse would be suitable because of its central location and its space capacity. The

concentration of the material assets in one location will facilitate management, maintenance, and cross-training by the people who will actually deploy and use them.

Second, the research has shown that even though CFEMS owns an impressive collection of applicable material assets, the organization does not have the manpower to utilize these assets. Thusly, the project recommends utilizing CERT and Volunteer Recruitment as two avenues to recruit non-operational volunteers interested in logistical support. These are two well established access points to the community that allow CFEMS to tap into an infinite pool of citizens who are potentially willing to devote their time and skills to support their local fire department.

Third, CFEMS needs to develop a formal, written procedure for extended logistical support that defines the individual processes, roles, responsibilities, authorities, and performance expectations. Additionally, the procedure needs to clarify the appropriate and justifiable use of the extended logistical support assets. Especially, the criteria, such as geographic response area, i.e., within vs. outside Chesterfield County, and the type of events, i.e., government vs. private supported events, need to be defined. The procedure needs to be developed with the key stakeholders involved, sanctioned by the executive leadership, communicated to the organization, exercised regularly, and improved continuously.

What needs to happen next is that the key stakeholders, viz., RMD, Operations, CERT, and Volunteer Recruitment, form a Logistics Support Working Group. It is recommended that RMD takes ownership of extended logistical support, and the battalion chief of RMD assumes the leadership role of the working group. The working group's immediate objectives are to identify the different logistical support tasks needed for each of the seven pillars that carry extended logistical support. Next, the working group needs to identify the time and functional perimeters and to estimate the appropriate manpower for each task. Additionally, the working

group has to develop a credentialing plan to standardize the training, experience, and skill requirements for each functional position. All this information needs to be integrated in the written procedure.

Equipped with the job descriptions from the credentialing plan, the coordinators for CERT and Volunteer Recruitment will be in a position to start the recruitment process, utilizing the existing cadre of personnel and their avenues to the community. With the help from other divisions, the two coordinators will be able to set up initial training classes for groups of recruited logistics support volunteers. For instance, operational personnel, who have deployed the Western Shelter System in the past, would be best suited to teach Western Shelter assembly.

The next objective of the working group is to adopt a model that can be utilized as a consistent template and be easily tailored to the needs of an incident or special event. The Extended Logistical Support Model (ELS Model) in Appendix L is the author's recommendation and is built upon the findings from this research project. The structure of the ELS Model is scalable, flexible, and adaptable. It encapsulates the overall plan for the new method to extend logistical support for CFEMS. The ELS Model is founded on modularity with built-in layers of manpower and material assets. The green off-set boxes in the model symbolize the built-in layers of resources that can be added as needed. The structure of the ELS Model exemplifies economy of resources and cost effectiveness by balancing standardization with flexibility. The ELS Model integrates the key stakeholders into a single command structure. The aligned roles and responsibilities of the key stakeholders promote an efficient line of communication, which eliminates redundancy, maximizes flexibility, and circumvents unnecessary layers of approval. Lastly, the ELS Model is NIMS compliant, which was requisite in order to make it a compatible template for neighboring jurisdictions. Compatibility will become more prevalent with the

introduction of a possible regional IMT in the near future.

While the project recommends that RMD takes ownership of extended logistical support, it has become evident that its success depends on support from all divisions. It is suggested that the RMD staff serve as the nucleus of the organizational structure but remain strategic and maintain oversight in their functional areas. The RMD staff should not be tasked with the sole responsibility of training the volunteers and maintaining the material assets. Instead, all divisions, as benefactors of the ELS Model, will have to contribute their share of assistance to RMD for the model to work.

The author utilized color coding to facilitate visualization of its modular structure. The core of the structure is staffed by RMD personnel and colored in yellow. It is complemented by structures in green that are staffed by volunteer members from CERT and Volunteer Recruitment. Positions and functions in blue are managed by full-time personnel from divisions other than RMD. The liaison, filled by the Emergency Management Unit, serves as the orchestrator of resources in a command staff capacity (see Appendix L).

After consenting to the ELS Model, the working group needs to develop planning scenarios for probable deployments and draft pre-scripted mission assignments for the various functions within the model. Lastly, the working group needs to prepare a deployment exercise. It should begin in a tabletop format with all overhead positions involved and then progress to a full-scale, hands-on deployment exercise. The tabletop and full-scale exercises will be the true evaluation of the effectiveness of the draft procedure and the functionality of the ELS Model. Following the deployment exercise, the working group needs to make adjustments and improvements to fine tune the model and to finalize the procedure. This completes the initial round in the PDSA Cycle and sets the stage for subsequent cycles to continually improve the

ELS Model and the complementing procedure. At that point, the working group can disband and the RMD battalion chief can assume ownership of the model.

In the long-term, it is recommended that RMD conducts two yearly deployment exercises to ensure that the logistics support volunteers remain proficient in their functional areas and stay engaged with CFEMS. The extended logistical support procedure, as well as the ELS Model, should be regarded as "living" documents that require constant evaluation and fine-tuning. This will ensure the functionality and reliability of the recommended method to extend logistical support when it is needed.

Based on the learning experience from this research project, the author has some recommendations for other researchers, who would like to replicate some or all of the study.

First, it became evident early on that the fire service had an opportunity to learn a lot about extended logistical support from the private industry and the military. While the fire service mostly relies on its problem solving skills to sustain front-line operations, the private industry and the military apply sophisticated and tested business models and principles to achieve success. Conceptually, extended logistical support in the fire service should not differ from the private industry and the military. We are accountable to the taxpaying citizens to exercise sound fiscal management. And, we owe it to our own at the front line to maintain a suitable infrastructure to accomplish the mission and to ensure their well-being.

Second, it proved to be of great benefit to identify the key stakeholders of extended logistical support, to understand their perspective on the subject, to learn from their experiences, and to engage them in the research project.

Third, the strategy of using two surveys, one internally and one externally, produced valid data from two different angles. The collected data also ensured objectivity and avoided

bias. In addition, the pilot for each survey provided welcomed critique. Especially, asking a non-fire related professional to review the survey questions helped avoid jargon and loaded or biased questions.

Fourth, the author considered it imperative that the recommendations clearly reflected the research findings and not personal preferences or ideas. As a result, it can be claimed with confidence that the recommendations from this research project are supported by valid and meaningful data.

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Appendix A: Resource Management Division Organization Chart

**CHESTERFIELD
FIRE & E.M.S.**

RESOURCE MANAGEMENT DIVISION

EDWARD L. SENTER, JR.
Chief of the Department

JAMES E. GRAHAM
Management Services

DAVID S. "STEVE" PARROTT
Resource Management Division

PAM SMITH
Administrative
Secretary

FIXED FACILITIES UNIT

MAINTENANCE & LOGISTICS UNIT

JEFF TIGNOR
Coordinator

MARK TINSLEY
Captain

ROB BLANTON
Apparatus Coordinator
Lieutenant (Firefighter)

DARREN HURLEY
Apparatus Accessory
Coordinator Lieutenant

CHARLIE MITCHELL
Logistics Supervisor

PERRY TAYLOR
Maintenance Worker PT

VACANT
SCBA Technician

KELLY JORDAN
Logistics Technician

BOBBY PURYEAR
Maintenance Worker PT

Revised December 1, 2010

Source: CFEMS Resource Management Division, 2010

Appendix B: Long Duration Incidents 2006 through 2010

Time Interval	2006	2007	2008	2009	2010	Average
6 hours to 11 hours 59 minutes	18	11	7	7	12	11
>12 hours	5	2	4	4	2	3.4
Total incident >6 hours	23	13	11	11	14	14.4

Note. Raw data provided by CFEMS Planning Unit, 2010

Appendix C: CFEMS Personnel Numbers by Division

Division	Civilians	Firefighters	Officers	Total	%
Emergency Operations	2	287	93	382	82%
Fire & Life Safety	13	3	5	21	4.5%
Personnel Mgt & Development	10	1	6	17	3.7%
Budget & Planning	4	0	4	8	1.7%
Resource Management	3	0	5	8	1.7%
Executive Staff	1	0	5	6	1.3%
Revenue Recovery	4	11	0	15	3.3%
Information Technology	3	0	0	3	0.6%
Emergency Management	3	0	0	3	0.6%
EMS	0	1	2	3	0.6%
Total	43	303	120	466	100%

Note. The 11 firefighter positions under Revenue Recovery are funded positions by the revenue recovery program.
Source. CFEMS Planning Unit, 2010

Appendix D: Questions for Ms. Sherri Laffoon – CERT Program Coordinator

1. What is the Chesterfield CERT member profile (number, gender, age, etc.)?

2. What are their current capabilities (what can they do)?

3. What are their potential capabilities (what more could they be doing)?

4. Is there an interest in expanding their Area of Responsibility (AoR)?

5. How are the CERT members activated, and what is their response time frame?

6. How do you communicate and stay in touch with the CERT members?

7. Is there a yearly budget for CERT training and initiatives?

8. How do you handle liability concerns?

9. Do they go through some type of background checks (driving records, criminal records, etc.)

Appendix E: Questions for Mr. David Tesh – Volunteer Coordinator

1. What is the profile of non-operational volunteers (number of volunteers, gender, age, etc.)

2. Are there any logistics support volunteers, and what are their current capabilities (what can they do)?

3. What are their potential capabilities (what more could they be doing)?

4. Is there an interest in expanding their Area of Responsibility (AoR) to incident or event support?

5. How do you communicate and stay in touch with the non-operational volunteer members?

6. Is there a yearly budget for non-operational volunteer training and initiatives?

7. How do you handle liability concerns?

8. Do they go through some type of background checks (driving records, criminal records, etc.)?

Appendix F: Composition of Sample Group for Internal Survey

1 Fire Chief (career position)

1 Deputy Chief Emergency Operations (career position)

1 Deputy Chief Management Services (career position)

3 Shift Commanders (career positions)

1 Battalion Chief Emergency Medical Services (career position)

1 Battalion Chief Resource Management (career position)

1 Battalion Chief Fire and Life Safety (career position)

1 Battalion Chief Personnel Management and Development (career position)

1 Battalion Chief Planning and Finance (career position)

1 Battalion Chief Community Relations (career position)

10 Battalion Chiefs Emergency Operations (career positions)

3 Emergency Management staff (civilian positions)

1 Captain Resource Management (career position)

2 Maintenance & Logistics Unit staff (civilian positions)

1 Volunteer Coordinator (civilian position)

7 District Chiefs (volunteers)

3 Specialty Team Leaders (career positions; captains; HazMat, SCUBA, TRT)

1 Company 13 auxiliary unit leader (volunteer)

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40 Total for survey sample for internal survey

Appendix G: Questions for Internal Survey

1. Logistical Support for Long Duration Incidents and Special Events

The purpose of this survey is to find a method to provide extended logistical support during long duration incidents (beyond first operational period) and special events (community events, athletic competitions, large scale exercises, etc.)

1. Based on your experience, what is needed to provide extended logistical support at long duration incidents or special events (check all that apply)?

☐ Logistics plan or procedure

☐ Manpower trained at performing logistical tasks

☐ Non-specified manpower

☐ Power generators

☐ Rehab Unit for food and drink

☐ Sanitation equipment (toilets, field sinks, showers, etc.)

☐ Tents (for work, rest, or storage area, etc.)

☐ Other (please specify)

*

2. Based on your experience, extended logistical support to front line resources in our organization is:

◯ sufficient

◯ insufficient

◯ non-existent

◯ identified as a weakness and should be addressed as soon as possible

◯ identified as a weakness but should not be a priority at this time

Appendix G: Questions for Internal Survey (cont.)

3. Based on your experience, what are the most common logistics problems at long duration incidents or special events that you have been experiencing (check all that apply)?

☐ Activation and deployment procedure

☐ Approval process

☐ Availability of appropriate equipment

☐ Did not know what assets were available

☐ Lack of manpower

☐ Level of proficiency at logistical tasks

☐ No logistics plan or procedure in place

☐ Roles and responsibilities not specified

☐ Other (please specify)

4. In your opinion, the value of effective logistical support to front line resources increases proportionally to the length of time of an operation.

○ Strongly agree

○ Agree

○ Don't know

○ Disagree

○ Strongly disagree

5. In your opinion, the ability to provide extended logistical support is:

○ Nice to have but not critical to the outcome

○ Critical for a successful outcome

○ Not needed

6. In your opinion, extended logistical support is a task, which should be assigned to?

○ Emergency Management

○ Emergency Operations

○ Resource Management

○ Other (please specify)

Appendix G: Questions for Internal Survey (cont.)

7. In your opinion, what available CFEMS material assets could be utilized for extended logistical support?

8. In your opinion, what manpower resource(s) should be utilized to assist with extended logistical support (check all that apply)?

☐ Call-back/hire-back operational personnel

☐ Civilian employees from other county departments

☐ Civilian employees within the organization

☐ Community Emergency Response Team (CERT) Members

☐ Community volunteers not associated with CFEMS

☐ Non-operational CFEMS volunteers

☐ On duty operational personnel

☐ Operational CFEMS volunteers

☐ Personnel assigned to Budget & Planning Division

☐ Personnel assigned to Personnel Management & Development Division

☐ Personnel assigned to the F&LS Division

☐ Personnel assigned to the Resource Management Division

☐ Other (please specify)

9. Your perspective on the subject matter is important to the project and very much appreciated. Thank you for your time. Feel free to leave any additional comments that you would like to share.

Appendix H: Composition of Sample Group for External Survey

9 Participants of the Logistics Section Chief Training Class, National Capitol Region – All

   Hazards IMT

17 Members of the Virginia State Fire Chiefs Resource Management Group

19 EFO students from the December 2010 EAFSOEM class

45 Total for survey sample for external survey

Appendix I: Questions for External Survey

1. Logistical Support for Long Duration Incidents and Special Events

The purpose of this survey is to learn how your organization manages logistical support during long duration incidents (beyond first operational period) and special events (community events, athletic competitions, large scale exercises, etc.)

1. Based on your experience, what is needed to provide extended logistical support at long duration incidents or special events (check all that apply)?

☐ Logistics plan or procedure

☐ Manpower trained at performing logistical tasks

☐ Non-specified manpower

☐ Power generators

☐ Rehab unit for food and drink

☐ Sanitation equipment (toilets, field sinks, showers, etc.)

☐ Tents (for work, rest, or storage area, etc.)

☐ Other (please specify)

2. In your opinion, extended logistical support to front line resources in your department is:

○ sufficient

○ insufficient

○ non-existent

○ identified as a weakness and will be addressed as soon as possible

○ identified as a weakness but unable to address at this time

Appendix I: Questions for External Survey (cont.)

3. Based on your experience, what are the most common logistics problems at long duration incidents or special events that you have experienced (check all that apply)?

☐ Activation and deployment procedure

☐ Approval process

☐ Availability of appropriate equipment

☐ Did not know what assets were available

☐ Lack of manpower

☐ Level of proficiency at logistical tasks

☐ No logistics plan or procedure in place

☐ Roles and responsibilities not specified

☐ Other (please specify)

4. What assets does your organization own to provide extended logistical support (check all that apply)?

☐ Do not own any assets for this purpose

☐ Manpower identified for this purpose

☐ Power generators

☐ Rehab Unit for food and drink

☐ Sanitation equipment (toilets, field sinks, showers, etc.)

☐ Tents (for work, rest, or storage area, etc.)

☐ Other (please specify)

Appendix I: Questions for External Survey (cont.)

5. What resources does your organization utilize to assist with extended logistical support (check all that apply)?

☐ Call-back/hire-back operational personnel

☐ Civilian employees from other government departments

☐ Civilian employees within the organization

☐ Community Emergency Response Team (CERT) Members

☐ Community volunteers not associated with Fire and EMS

☐ Fire Corps (volunteers who can assist in non-emergency roles)

☐ Non-operational Fire or EMS volunteers

☐ On-scene personnel by choice (because they are the preferred resources)

☐ On-scene personnel by default (because no other resources are available)

☐ Operational Fire or EMS volunteers

☐ Other (please specify)

6. Does your organization have a written plan or procedure in place for extended logistical support?

☐ Yes

☐ No

7. If you answered "Yes" in the above question and are willing to share your plan or procedure, please leave your e-mail address or phone number so the author can get in touch with you.

8. In your opinion, the ability to provide extended logistical support is:

☐ Nice to have but not critical to the outcome

☐ Critical for a successful outcome

☐ Not needed

Appendix I: Questions for External Survey (cont.)

9. In your opinion, the value of effective logistical support to front line resources increases proportionally to the length of time of an operation.

☐ Strongly agree

☐ Agree

☐ Don't know

☐ Disagree

☐ Strongly disagree

10. What is the size of your department?

☐ Less than 249 personnel

☐ 250 - 899 personnel

☐ More than 900 personnel

Appendix J: Survey Results – Internal Survey

1. Based on your experience, what is needed to provide extended logistical support at long duration incidents or special events (check all that apply)?		
	answered question	19
	skipped question	0
	Response Percent	**Response Count**
Non-specified manpower	31.6%	6
Manpower trained at performing logistical tasks	84.2%	16
Power generators	57.9%	11
Tents (for work, rest, or storage area, etc.)	78.9%	15
Sanitation equipment (toilets, field sinks, showers, etc.)	84.2%	16
Rehab Unit for food and drink	**94.7%**	**18**
Logistics plan or procedure	73.7%	14
Other (please specify)	31.6%	6

1.	Fuel truck	Tue, Jan 18, 2011 1:50 PM	Find...
2.	Ability to communicate incident wide is huge.	Fri, Jan 14, 2011 10:12 PM	Find...
3.	ICS training	Mon, Jan 10, 2011 9:00 AM	Find...
4.	Possibly replacement PPE for personnel	Mon, Jan 10, 2011 7:21 AM	Find...
5.	Budgetery issues	Sun, Jan 9, 2011 10:17 PM	Find...
6.	Communications equipment	Sun, Jan 9, 2011 4:13 PM	Find...

Appendix J: Survey Results – Internal Survey (cont.)

2. Based on your experience, extended logistical support to front line resources in our organization is:

	answered question	19
	skipped question	0

	Response Percent	Response Count
sufficient	10.5%	2
insufficient	26.3%	5
non-existent	5.3%	1
identified as a weakness and should be addressed as soon as possible	**47.4%**	**9**
identified as a weakness but should not be a priority at this time	10.5%	2

Appendix J: Survey Results – Internal Survey (cont.)

3. Based on your experience, what are the most common logistics problems at long duration incidents or special events that you have been experiencing (check all that apply)?

	answered question	19
	skipped question	0

	Response Percent	Response Count
No logistics plan or procedure in place	36.8%	7
Lack of manpower	**73.7%**	**14**
Activation and deployment procedure	68.4%	13
Availability of appropriate equipment	36.8%	7
Roles and responsibilities not specified	52.6%	10
Approval process	21.1%	4
Did not know what assets were available	26.3%	5
Level of proficiency at logistical tasks	36.8%	7
Other (please specify)	10.5%	2

1.	I think Chief Parrott is getting a handle on this now.	Mon, Jan 10, 2011 7:21 AM	Find...
2.	Hiring back career instaed of askingh volunteers	Sun, Jan 9, 2011 10:17 PM	Find...

Appendix J: Survey Results – Internal Survey (cont.)

4. In your opinion, the value of effective logistical support to front line resources increases proportionally to the length of time of an operation.

	answered question	19
	skipped question	0

	Response Percent	Response Count
Strongly agree	36.8%	7
Agree	**47.4%**	**9**
Don't know	10.5%	2
Disagree	5.3%	1
Strongly disagree	0.0%	0

5. In your opinion, the ability to provide extended logistical support is:

	answered question	19
	skipped question	0

	Response Percent	Response Count
Nice to have but not critical to the outcome	21.1%	4
Critical for a successful outcome	**78.9%**	**15**
Not needed	0.0%	0

Appendix J: Survey Results – Internal Survey (cont.)

6. In your opinion, extended logistical support is a task, which should be assigned to?		
answered question		19
skipped question		0

	Response Percent	Response Count
Emergency Operations	10.5%	2
Resource Management	**68.4%**	**13**
Emergency Management	5.3%	1
Other (please specify)	15.8%	3

1.	Personnel trained from any division available for recall and financial means to pay	Mon, Jan 10, 2011 9:00 AM	Find...
2.	RMD should have the lead with support from OPS	Mon, Jan 10, 2011 7:21 AM	Find...
3.	Specifically selected and trained individuals- LEOS and otherwise	Sun, Jan 9, 2011 5:17 PM	Find...

Appendix J: Survey Results – Internal Survey (cont.)

7. In your opinion, what available CFEMS material assets could be utilized for extended logistical support?

	answered question	12
	skipped question	7

	Response Count
	12

1	N/A	Tue, Jan	Find
2.	I think anything our organization has or can aquire will be a resource made available for a long term incident. The list of what may be needed could be extensive with a lot of variables.	Tue, Jan 18, 2011 1:50 PM	Find...
3.	tent city / Logistics Division (food, ground support, equipment & supplies/ Rehab 13 / facilities managment)	Fri, Jan 14, 2011 10:12 PM	Find...
4.	tent city, delivery truck with lift, air utility, MCC, polaris ATVs	Tue, Jan	Find...
5.	Rehab 13 shelter system all vehicles	Mon, Jan 10, 2011 5:49 PM	Find...
6.	The current assets we have (example : Western Shelter system) is a great asset, however it takes too many personnel to deploy. We need a dedicated rehab unit that can be deployed for small & large/extended	Mon, Jan 10, 2011 10:55 AM	Find...
7.	Tents Rehab units general logistical supplies already housed and stored in Resource Management	Mon, Jan 10, 2011 9:00 AM	Find...
8.	Tent City, Rehab 13, RMD resources, M.C.C (office space)	Mon, Jan	Find...
9.	Tent City, Trailer Generator as well as portable generators assigned to	Mon, Jan	Find...
10.	Hire "other" people to keep overall costs down instead of using "hire	Sun, Jan 9,	Find...
11.	Logistics personnel and part time personnel, Volunteers and logistics	Sun, Jan 9,	Find...
12.	Volunteer fire companies and rescue squads	Sun, Jan 9,	Find...

Appendix J: Survey Results – Internal Survey (cont.)

8. In your opinion, what manpower resource(s) should be utilized to assist with extended logistical support (check all that apply)?		
answered question		19
skipped question		0
	Response Percent	**Response Count**
Operational CFEMS volunteers	63.2%	12
Non-operational CFEMS volunteers	63.2%	12
Community Emergency Response Team (CERT) Members	78.9%	15
Community volunteers not associated with CFEMS	15.8%	3
Civilian employees within the organization	63.2%	12
Civilian employees from other county departments	36.8%	7
On duty operational personnel	36.8%	7
Call-back/hire-back operational personnel	63.2%	12
Personnel assigned to the Resource Management Division	**89.5%**	**17**
Personnel assigned to the F&LS Division	21.1%	4
Personnel assigned to Personnel Management & Development	36.8%	7
Personnel assigned to Budget & Planning Division	26.3%	5
Other (please specify) **Show Responses**	15.8%	3

Appendix J: Survey Results – Internal Survey (cont.)

1.	Any county employee should be utilized to assist with any emergency that requires help. This should apply to large incidents that overwhelm the departments current resources.	Tue, Jan 18, 2011 1:37 PM	Find...
2.	anyone adequately aware of the procedures, equipment, and policies we have.	Tue, Jan 11, 2011 9:49 PM	Find...
3.	I am hesitant to suggest civilian personnel to serve in an operational logistical capacity. Especially during normal work hours. As for Resource management division assisting, I believe they should supply the rehab unit with supplies & limited manpower if available. Nights & weekends would create issues trying to utilize the civilian staff or other division staff	Mon, Jan 10, 2011 10:55	

9. Your perspective on the subject matter is important to the project and very much appreciated. Thank you for your time. Feel free to leave any additional comments that you would like to share.

	answered question	4
	skipped question	15

		sponse Count 4

1.	Extended logistical support is not directly proportional to the duration of an incident. It is not needed for short incidents, then becomes steeply crucial in the first few operational periods. After that it does not increase with additional time. It ramps up and stays up until incident demob is complete.	Tue, Jan 11, 2011 9:49 PM	Find...
2.	Logistical support is important, we do a fair job of it as needed for large incidents. We need to perform a needs assessment, project plan and resource allocation for logistical support.	Mon, Jan 10, 2011 5:49 PM	Find...
3.	Until we have a dedicated vehicle to support rehab & extended operations to provide logistical support, emergency operations will need to support this function.	Mon, Jan 10, 2011 10:55 AM	Find...
4.	Hire full time those "volunteers" with departmental operations knowledge to keep costs down instead of doing a "hire back" at double/triple the costs	Sun, Jan 9, 2011 10:17 PM	Find...

Appendix K: Survey Results – External Survey

1. Based on your experience, what is needed to provide extended logistical support at long duration incidents or special events (check all that apply)?

	answered question	17
	skipped question	0

	Response Percent	Response Count
Logistics plan or procedure	**100.0%**	**17**
Manpower trained at performing logistical tasks	88.2%	15
Non-specified manpower	29.4%	5
Power generators	52.9%	9
Rehab unit for food and drink	82.4%	14
Sanitation equipment (toilets, field sinks, showers, etc.)	82.4%	14
Tents (for work, rest, or storage area, etc.)	70.6%	12
Other (please specify)	41.2%	7

1.	department support for expanded service/support functions	Tue, Jan 11, 2011	Find...
2.	re-fueling capabilities for apparatus; equipment cache; I.T. support; communications support (batteries, etc)	Mon, Jan 10, 2011	Find...
3.	Support for Family members depending on the duration/severity of the incident	Mon, Jan 10, 2011	Find...
4.	AN AREA THAT IS QUIET AND ALLOWS FOR TRUE REST	Mon, Jan 10, 2011	Find...
5.	Very incident specific. If your event is indoors, you likely wont need sanitation equipment, but you may need to increase the amount of sanitation services.	Mon, Jan 10, 2011	Find...
6.	Fuel, ground support	Sun, Jan 9, 2011	Find...
7.	proper medical care for responders	Sun, Jan 9, 2011	Find...

Appendix K: Survey Results – External Survey (cont.)

2. In your opinion, extended logistical support to front line resources in your department is:

	answered question	17
	skipped question	0

	Response Percent	Response Count
sufficient	**47.1%**	**8**
insufficient	23.5%	4
non-existent	11.8%	2
identified as a weakness and will be addressed as soon as possible	5.9%	1
identified as a weakness but unable to address at this time	11.8%	2

Appendix K: Survey Results – External Survey (cont.)

3. Based on your experience, what are the most common logistics problems at long duration incidents or special events that you have experienced (check all that apply)?

	answered question	17
	skipped question	0

	Response Percent	Response Count
No logistics plan or procedure in place	**52.9%**	**9**
Lack of manpower	41.2%	7
Activation and deployment procedure	29.4%	5
Availability of appropriate equipment	47.1%	8
Roles and responsibilities not specified	**52.9%**	**9**
Approval process	11.8%	2
Did not know what assets were available	47.1%	8
Level of proficiency at logistical tasks	17.6%	3
Other (please specify)	17.6%	3

1.	Very strong in terms of scheduled events; however, deploying in an emergency is not as well organized	Mon, Jan 10, 2011	Find...
2.	Communication	Mon, Jan 10, 2011	Find...
3.	From a broader view, there is not common knowledge about what assets are available. Specific agencies know what they own, but generally not what is available outside their own agency. Manpower becomes an issue for very lengthy operations, which leads to inexperienced personnel being used and has a cascading effect on the operation.	Mon, Jan 10, 2011	Find...

Appendix K: Survey Results – External Survey (cont.)

4. What assets does your organization own to provide extended logistical support (check all that apply)?

answered question	17
skipped question	0

	Response Percent	Response Count
Rehab Unit for food and drink	41.2%	7
Tents (for work, rest, or storage area, etc.)	47.1%	8
Sanitation equipment (toilets, field sinks, showers, etc.)	29.4%	5
Power generators	**70.6%**	**12**
Do not own any assets for this purpose	11.8%	2
Manpower identified for this purpose	47.1%	8
Other (please specify)	29.4%	5

1.	Several 85Kw towed generators, we utilize the Salvation Army for a food unit	Mon, Jan 10, 2011 12:04 PM	Find...
2.	Fuel truck; equipment cache, radio cache	Mon, Jan 10, 2011 11:39 AM	Find...
3.	We have a trailer for MCI events, but for other events, we deploy requested items from our main office.	Mon, Jan 10, 2011 8:54 AM	Find...
4.	Very well equipped for in county incidents, contracts in place, agreements understood	Mon, Jan 10, 2011 8:40 AM	Find...
5.	We have some small portable generators and about 1000 MRE's but nothing has been identified for the this purpose.	Mon, Jan 10, 2011 8:23 AM	Find...

Appendix K: Survey Results – External Survey (cont.)

5. What resources does your organization utilize to assist with extended logistical support (check all that apply)?

	answered question	17
	skipped question	0

	Response Percent	Response Count
Operational Fire or EMS volunteers	35.3%	6
Non-operational Fire or EMS volunteers	5.9%	1
Community Emergency Response Team (CERT) Members	29.4%	5
Fire Corps (volunteers who can assist in non-emergency roles)	11.8%	2
Community volunteers not associated with Fire and EMS	17.6%	3
Civilian employees within the organization	41.2%	7
Civilian employees from other government departments	35.3%	6
On-scene personnel by choice (because they are the preferred resources)	17.6%	3
On-scene personnel by default (because no other resources are available)	23.5%	4
Call-back/hire-back operational personnel	**76.5%**	**13**
Other (please specify)	11.8%	2

1.	Appropriate sworn staff (40-hour officers)	Mon, Jan 10, 2011 11:39 AM	Find...
2.	Ham radio operators(trained by Department) in the event Radio towers are compromised	Mon, Jan 10, 2011 8:40 AM	Find...

Appendix K: Survey Results – External Survey (cont.)

6. Does your organization have a written plan or procedure in place for extended logistical support?

	answered question	17
	skipped question	0

	Response Percent	Response Count
Yes	29.4%	5
No	**70.6%**	**12**

7. If you answered "Yes" in the above question and are willing to share your plan or procedure, please leave your e-mail address or phone number so the author can get in touch with you.

	answered question	3
	skipped question	14

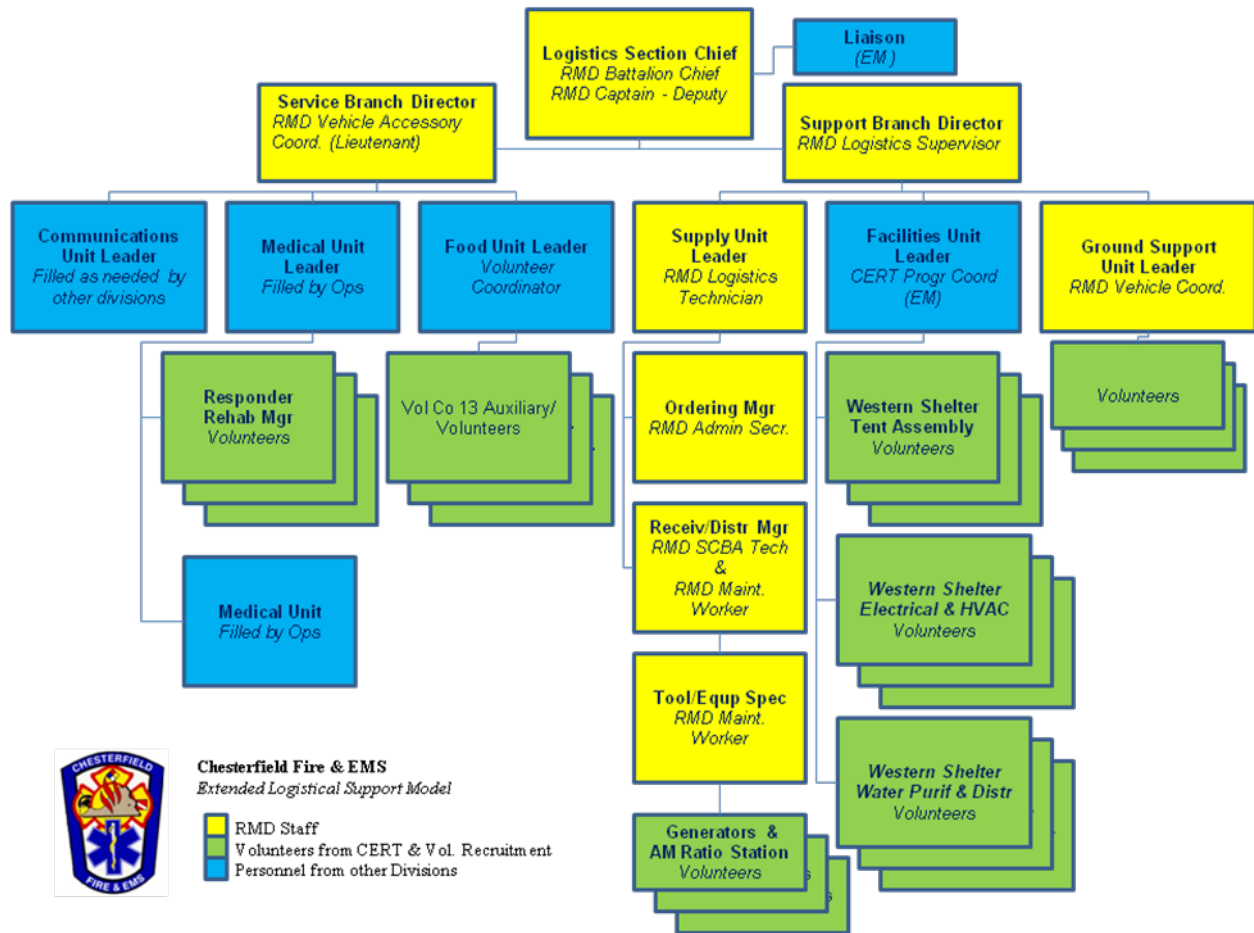|		Response Count
Hide Responses		3
1.	We have a plan as part of our EOP, contact Anna McRay, MCR@co.henrico.va.us	Mon, Jan 10, 2011 12:04 PM	Find...
2.	Yes but it basically follows the blue FIRESCOPE book with people with Logs plugged in.	Mon, Jan 10, 2011 8:40 AM	Find...
3.	I believe that you spoke with Chief Fernandez	Mon, Jan 10, 2011 8:24 AM	Find...

Appendix K: Survey Results – External Survey (cont.)

8. In your opinion, the ability to provide extended logistical support is:

	answered question	17
	skipped question	0

	Response Percent	Response Count
Nice to have but not critical to the outcome	5.9%	1
Critical for a successful outcome	**94.1%**	**16**
Not needed	0.0%	0

9. In your opinion, the value of effective logistical support to front line resources increases proportionally to the length of time of an operation.

	answered question	17
	skipped question	0

	Response Percent	Response Count
Strongly agree	41.2%	7
Agree	**58.8%**	**10**
Don't know	0.0%	0
Disagree	0.0%	0
Strongly disagree	0.0%	0

Appendix L: Extended Logistical Support Mode (ELS Model)

Source: Author, 2011