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SUSTAINING STATEWIDE DISASTER RESPONSE CAPABILITIES FROM A FIRE SERVICE PERSPECTIVE

by

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March 2013

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The events of 9/11 and Hurricane Katrina have forever changed the way we look at disaster readiness and response from an emergency-response perspective at the local, state, and federal levels of government. A public expectancy of preparedness and resilience for emergency-response organizations that leverages collaboration in order to meet mission requirements is a primary focus of government. To assist emergency-responder readiness at the state and local levels of government, the federal government has increased homeland security spending by more than 350 percent since 2001 (Federal Emergency Management Agency, 2012). Because of current fiscal constraints posed by a lagging economy, local and state emergency responders must find a more efficient way to prepare and manage disaster preparedness and response. Using the state of Texas as its focus, a policy analysis of centralized and decentralized disaster response has been studied in order to explore more efficient methods of disaster response. The emphasis is an analysis of how the fire service in Texas is integrated into Texas Task Force 1 Urban Search and Rescue, and how the statewide model of disaster response could be organized to maximize cost effectiveness and emergency responder capability.

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SUSTAINING STATEWIDE DISASTER RESPONSE CAPABILITIES FROM A FIRE SERVICE PERSPECTIVE

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ABSTRACT

The events of 9/11 and Hurricane Katrina have forever changed the way we look at disaster readiness and response from an emergency-response perspective at the local, state, and federal levels of government. A public expectancy of preparedness and resilience for emergency-response organizations that leverages collaboration in order to meet mission requirements is a primary focus of government. To assist emergency-responder readiness at the state and local levels of government, the federal government has increased homeland security spending by more than 350 percent since 2001 (Federal Emergency Management Agency, 2012). Because of current fiscal constraints posed by a lagging economy, local and state emergency responders must find a more efficient way to prepare and manage disaster preparedness and response. Using the state of Texas as its focus, a policy analysis of centralized and decentralized disaster response has been studied in order to explore more efficient methods of disaster response. The emphasis is an analysis of how the fire service in Texas is integrated into Texas Task Force 1 Urban Search and Rescue, and how the statewide model of disaster response could be organized to maximize cost effectiveness and emergency responder capability.

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LIST OF ACRONYMS AND ABBREVIATIONS

AHJ	Authority Having Jurisdiction
ALS	Advanced Life Support
BLS	Basic Life Support
CBRN	Chemical, Biological, Radiological, and Nuclear
CE	Continuing Education
CO	Carbon Monoxide
COG	Council of Government
COSA	City of San Antonio
DDC	Disaster District Committee
DHS	Department of Homeland Security
DPS	Department of Public Safety
EMS	Emergency Medical Services
EMAC	Emergency Management Assistance Compact
EOC	Emergency Operations Center
ESF	Emergency Support Functions
FBI	Federal Bureau of Investigation
FDNY	New York City Fire Department
FEMA	Federal Emergency Management Agency
GWOT	Global War on Terrorism
HMRT	Hazardous Materials Response Team
HMT	Hazardous Materials Technician

HSGP	Homeland Security Grant Program
HSPD	Homeland Security Presidential Directive
IC	Incident Commander
IAP	Incident Action Plan
IP	Incentive Pay
IDLH	Immediately Dangerous to Life or Health
IED	Improvised Explosive Device
IFSAC	International Fire Service Accreditation Congress
KSA	Knowledge, Skills, and Abilities
LEPC	Local Emergency Planning Committees
LETPA	Law Enforcement Terrorism Prevention Activities
MCI	Mass Casualty Incident
MMRS	Metropolitan Medical Response System
NGO	Non-Governmental Organizations
NPG	National Preparedness Goal
NFIRS	National Fire Incident Reporting System
NFPA	National Fire Protection Association
NIMS	National Incident Management System
NRF	National Response Framework
NSHS	National Strategy for Homeland Security
NYPD	New York Police Department
OPSG	Operation Stone-Garden
OSHA	Occupational Safety & Health Administration

OT	Overtime
PET	Punctuated Equilibrium Theory
PPE	Personnel Protective Equipment
RIT	Rapid Intervention Team
SAR	Search and Rescue
SCBA	Self-Contained Breathing Apparatus
SEMC	State Emergency Management Council
SHSP	State Homeland Security Program
SME	Subject Matter Expert
SOC	State Operations Center
SOCOM	Special Operations Command
SOF	Special Operations Forces
SOP	Standard Operating Procedures
STEMP	State of Texas Emergency Management Plan
TCL	Target Capabilities List
TCEQ	Texas Commission on Environmental Quality
TCFP	Texas Commission on Fire Protection
TDEM	Texas Department of Emergency Management
TEEX	Texas Engineering Extension Service
TFS	Texas Forest Service
TRT	Technical Rescue Team
TX-TF1	Texas Task Force 1
USAR	Urban Search and Rescue

UASI	Urban Area Security Initiative
US&R	Urban Search & Rescue
UTL	Universal Task List
WMD	Weapons of Mass Destruction

EXECUTIVE SUMMARY

The purpose of this thesis was to explore different models for disaster response in the state of Texas. When examining the literature pertaining to this subject, the following research question was formulated:

> *How can statewide homeland security disaster response objectives be sustained with reduced funding from a fire-service perspective?*

To answer this question, a literature review was accomplished that reviewed the various disaster response strategies and ideologies at the local, state, and federal levels of government. This was done to provide clearer understanding of responsibilities at each level of government for disaster response and the current framework.

The methodology used was a policy analysis that used established criteria to rate the status quo centralized response model to a decentralized model. To establish the rating criteria for the policy analysis, the author examined the capabilities required in the fire service for disaster response and compared those to established capabilities used by a Type I US&R team (TX-TF1). This involved examining the different standards and practices at the different levels of government in two particular disciplines within the fire service; technical rescue, and hazardous materials response.

The thesis also explored the cost of sustaining disaster response capabilities by providing an overview of homeland security funding at the federal level of government since the tragedies of 09/11/2001. The cost of disaster-response sustainment was also explored at the local and state levels of government in order to identify redundancies in capabilities and ascertain mechanisms to streamline response capabilities and costs at the different levels of government.

The research conducted points to the decentralized response model that utilizes personnel that are on local special operation teams to establish Type II US&R teams in each recognized UASI in Texas that would then augment the type I US&R team as the best model. This model would: (1) increase the aptitude of responders by employing personnel that are up-to-date on KSAs, which are in current use for their present job, (2)

simplify training and equipment expense by removing the redundancy of training and equipping two groups of responders. By redirecting resources to support a decentralized response organization, it allows for a more flexible and rapid framework for disaster response within the state.

A decentralized framework is currently utilized in the state of Texas to activate boat teams within a swift-water strike force during flooding events in different areas of the state. This program has been shown to be a more cost efficient method by utilizing the expertise of local responders that are trained to specific criteria established by TX-TF1. A decentralized approach to disaster response at the state level that streamlines and folds the local response effort into the state response provides a more efficient and proficient approach to disaster mitigation.

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I. INTRODUCTION

A. PROBLEM STATEMENT

With a national debt of close to 15 trillion dollars for the United States (Jaffe, 2011), spending at all levels of government needs to be done as efficiently and as effectively as possible, while maximizing the return on investment for emergency response. In this light, the state of Texas may want to reevaluate its emergency-management policy for allocation of funds for emergency response to major catastrophes in order to reduce duplication of efforts and maximize emergency-response effectiveness.

Like many other states in the union, the state of Texas has had HSGP (Homeland Security Grant Program)[1] funding drastically reduced or eliminated in several major cities. In particular, the Urban Area Security Initiative (UASI), which directly supports regional systems for prevention, protection, response, and recovery, has been substantially reduced. Local fire departments in these jurisdictions must find a way to maintain the level of emergency response needed to mitigate the effects of disasters. While maintaining an effective local disaster response is important, it is equally important to prepare for larger events that inundate local emergency response systems within the state and the United States. Texas Task Force 1(TX-TF1) provides the capability to respond to large-scale disasters when local, regional, and state resources are overwhelmed. Funding for TX-TF1 is accomplished through FEMA and the state of Texas without any of the emergency preparedness grants from HSGP.

Fire service organizations have an important role to play to protect the community from man-made and natural disasters. Because these are not high frequency events, it is difficult for local jurisdictions to justify expenditures needed to train, equip, and maintain fire personnel to meet these homeland security needs because of the expense associated with this nontraditional response capability. During its 270-year-plus history, the fire service has played a conservative role in keeping the public safe by responding to fire

[1] Homeland Security Grant Program is a program in the United States established in 2003 and was designated to incorporate all projects that provide funding to local, state, and federal government agencies by the Department of Homeland Security.

suppression and rescue needs. Catastrophic events in our nation's history have shown a need for additional response capabilities to respond to natural and man-made disasters. The events of 9/11, Hurricane Katrina, and the Murrah Building bombing have motivated our nation's leaders to reevaluate the response capabilities needed to minimize the effect that a catastrophe could have on a community. Terrorist threats against our government and the potential for natural catastrophes or pandemic outbreaks have altered the traditional mission of the fire service, which requires additional response capabilities to cope with our changing environment. After the events of 9/11, the federal government established the Homeland Security Grant Program to assist local jurisdictions to meet homeland security threats. The 2012 HSGP supports the development and sustainment of programs that are aimed at fulfilling the National Preparedness Goal (NPG) and Presidential Policy Directive – 8 (PPD-8). HSGP comprises four interconnected grant programs that support training, planning, exercises, equipment purchases, etc. These programs are:

- State Homeland Security Program (SHSP)
- Urban Areas Security Initiative (UASI)
- Metropolitan Medical Response System (MMRS)
- Operation Stone-Garden (OPSG)

The state of Texas uses a tiered response to mitigate disasters that relies on local fire departments to supplement TX-TF1 to respond to events that overwhelm local response resources. TX-TF1, which is sponsored by the Texas Engineering Extension Service (TEEX) in College Station, Texas, consists of a Type I and Type II Urban Search and Rescue (USAR) team. It is made from more than 60 jurisdictions across Texas and has the capability to respond 24 hours a day and deploy within four hours of activation (Texas Engineering Extension Service, 2012). Personnel from fire departments from all over the state are selected to become technical experts in disaster response and mitigation. Funding (separate from UASI grants) for federal task forces to respond to national disasters comes from FEMA (United States, Federal Emergency Management Agency, 2012). TX-TF1 is one of the 28 FEMA Task Forces tasked with responding to

disasters within the United States (Texas Engineering Extension Service, 2012). The type of training and equipment used to prepare USAR personnel on TX-TF1 to mitigate disasters is the same that is used by local fire department special teams (technical rescue, hazmat, disaster medics), which HSGP has been funding. This redundancy for disaster response funded by HSGP for local responders, and from FEMA for TX-TF1, needs to be examined to provide the most cost efficient and effective method for disaster response**.**

The literature review (Chapter II) for this thesis researches the disaster response strategies established by the federal, state, and local levels of government and how these strategies relate to how the state of Texas mitigates the effects of disasters from a fire service perspective. The methodology chapter (Chapter III) examines the status quo and an alternative model for disaster response using policy option analysis. This method was selected to evaluate the disaster response approaches in the state of Texas by researching the contextual factors of current disaster response models. Chapter IV defines disaster response capabilities and requirements for the fire service by researching established national standards related to the disciplines within the fire service related to disaster mitigation. This was done to establish a baseline to compare and reference during the policy analysis. Financing disaster response is addressed in Chapter V, which will concentrate on the analysis of cost for responding to and recovering from natural and man-made events. This includes an analysis of federal funding for homeland security since 9/11, a hypothesis concerning punctuated equilibrium theory that may explain and forecast homeland security funding trends, disaster response funding in Texas, the cost to train disaster response personnel, and a conclusion of the information analyzed. Chapter VI examines two policy options that compare the current centralized method of disaster response to a decentralized model by utilizing established criteria as outlined in the methodology chapter. Chapter VII outlines the conclusions of the policy analysis, while Chapter VIII provides recommendations and strategic planning to implement the findings of the thesis.

B. RESEARCH QUESTIONS

How can statewide homeland security disaster response objectives be sustained with reduced funding from a fire service perspective?

a. What are the responsibilities for local, state, and federal governments to address policy, responsibilities, and strategy for first responders during disasters?

b. What response capabilities (specialized equipment and training) does the fire service need to respond to homeland security threats (natural or man-made disasters) that are not considered traditional fire department services?

c. How has the Homeland Security Grant Program (HSGP) affected response capabilities of emergency responders at the different levels of government?

d. How is the current framework of disaster response in the state of Texas organized, and are there opportunities to improve its efficiency and effectiveness?

e. Can local disaster response capabilities be harnessed at the state level of disaster response to provide a more proficient and capable response force?

II. LITERATURE REVIEW

A. BACKGROUND

During its 270-year-plus history, the fire service has traditionally been proactive in its role to keep the public safe by responding to fire suppression and rescue needs. Catastrophic events in our nation's history have shown a need for additional response capabilities to respond to natural and man-made disasters. The events of 9/11, Hurricane Katrina, and the Murrah Building bombing have motivated our nation's leaders to reevaluate the response capabilities needed to minimize the effect that a catastrophe could have on a community. Terrorist threats against our government, and the potential for natural catastrophes or pandemic outbreaks, have altered the traditional mission of the fire service to require additional response capabilities to cope with the changing environment in which we live. This literature review describes the expectations that each level of government has for disaster response based on a review of government strategic policies and goals.

For the federal level of government, the literature review examines the National Security Strategy, the National Preparedness Guidelines, the National Response Framework, and the National Incident Management Plan. By studying these strategies, information about preparedness, expectations, and lines of responsibilities for state and local government can be gleaned so that state and local governments have the needed resources to create their own strategic plans particular to their jurisdictional needs.

At the state level of government, the state of Texas Emergency Management Plan, the Texas Homeland Security Strategic Plan, the Texas Department of Emergency Management Annex R, Search and Rescue, as well as the Texas Intrastate Fire Mutual Aid System contain information and strategies to manage disasters in the state of Texas. These address how emergency responders at the local, regional, and state level of government will incorporate a tiered response and key principles to mitigate the effects of a catastrophe.

The emergency response plans at the local level of government was also assessed by exploring the city of San Antonio Emergency Management Basic Plan, the city of San Antonio Office of Emergency Management Mutual Aide Agreements, and the San Antonio Office of Emergency Management Annex R, Search and Rescue. This research gleans information to see whether these plans provide the needed direction for emergency response and management functions of mitigation, preparedness, response, and recovery for that local jurisdiction.

B. DISASTER RESPONSE STRATEGIES FOR THE FEDERAL GOVERNMENT

The Department of Homeland Security (DHS) is identified as the lead agency in charge of managing major catastrophes domestically. The Homeland Security Act of 2002 outlines the national strategies to coordinate the executive branch's efforts to detect, prepare for, prevent, protect against, respond to, and recover from terrorist attacks within the United States (Homeland Security Act of 2002). Homeland Security Presidential Directive-5 states:

> The Secretary of Homeland Security is the principal Federal official for domestic incident management. Pursuant to the Homeland Security Act of 2002, the Secretary is responsible for coordinating Federal operations within the United States to prepare for, respond to, and recover from terrorist attacks, major disasters, and other emergencies. (Bush, 2003)

1. National Security Strategy

DHS has developed guidelines to coordinate a nationwide approach to disaster management. A document that gives a holistic view of the federal government's strategy for disaster response is the National Security Strategy (NSS) published in May of 2010. The NSS is a comprehensive text that outlines a strategic overview for national security that incorporates the current issues concerning the economy, education, clean energy, global cooperation, and advancing technology to name a few. The NSS views the economy as the primary driver that provides the means to support homeland security initiatives. It also views the nation's deficit as a threat to the economy that must be addressed. The NSS states:

> At the center of our efforts is a commitment to renew our economy, which serves as the wellspring of American power. (United States President, 2010)

> Our commitment to deficit reduction will discipline us to make hard choices, and to avoid overreach. These steps complement our efforts to integrate homeland security with national security; including seamless coordination among federal, state, and local governments to prevent, protect against, and respond to threats and natural disasters. (United States President, 2010)

Although the NSS does discuss some of the issues related to disaster response, it is primarily a document that outlines practices from a strategic (federal and international) point of view. The document also addresses global challenges and strategies to build international partnership and preserve human rights.

2. Presidential Policy Directive 8 (PPD-8)

The Presidential Policy Directive on National Preparedness issued on March 30, 2011, replaces the Homeland Security Presidential Directive on National Preparedness (HSPD-8). The key principles for PPD-8 employ a whole community approach to integrate efforts across the different levels of government, private sector, nongovernmental organizations, and the community. It uses a risk-based approach to build core capabilities to confront preparedness challenges that are then assessed to measure and track progress. This is accomplished by integrating efforts across the five mission areas of prevention, protection, mitigation, response, and recovery on which the core capabilities and capability targets are established (Obama, 2011). PPD-8 is organized around strategic components, which are: The National Preparedness Goal (NPG), The National Preparedness System (NPS), National Planning Frameworks (NPF), Federal Interagency Operational Plans (FIOP), Build and Sustain Preparedness, and a National Preparedness Report (NPR) (Obama, 2011).

The National Preparedness Goal is a “secure and resilient nation with the capabilities required across the whole community to prevent, protect against, mitigate, respond to, and recover from the threats and hazards that pose the greatest risk” (FEMA, 2011) The primary elements to the NPG are (Obama, 2011):

- The *core capabilities* needed for national preparedness.
- Capability targets that will establish performance thresholds for each core capability.
- Emphasis on the whole community aspect of national preparedness.
- The Strategic National Risk Assessment (SNRA), which identifies a wide range of threats and hazards, that poses a significant risk to the nation.

The National Preparedness System is the mechanism that addresses the requirements outlined in PPD-8 and PKEMRA (Post Katrina Emergency Management Reform Act) for achieving the NPG. NPS provides the necessities to build and maintain capabilities to include (United States Department of Homeland Security, 2011):

- A national planning system that focus on federal interagency operational plans to maintain and deliver identified capabilities.
- Resource guidance to include how to share personnel to have the right people in the right place.
- Preparedness recommendations and guidance for businesses, communities, families and individuals.

The NPS comprises six major components: Identifying and assessing risk, estimating capability requirements, building and sustaining capabilities, planning to deliver capabilities, validating capabilities, and reviewing and updating the NPS (United States Department of Homeland Security, 2011).

Figure 2.1 The National Preparedness System Description Components (From United States Federal Emergency Management Agency, 2011)

The *National Planning Framework* is a compilation of the frameworks that are focused on the mission areas of prevention, protection, mitigation, response, and recovery. The goal of the NPF is to define how we, as a nation, work together to meet the needs of community devastated by natural or man-made disaster. The NPF identifies the scope of the mission, as well as roles and responsibilities for the stakeholders that can be used to identify and coordinate mechanisms for the delivery of core capabilities (United States Department of Homeland Security, 2011).

The Federal Interagency Operational Plans are used to develop and guide the execution of each of the five frameworks in a more detailed concept of operation to coordinate national level capabilities for support (United States Department of Homeland Security, 2011).

The building and sustainment of preparedness is composed of four components: a public outreach program that involves the community to include the private sector, federal preparedness, grants, technical assistance and other federal preparedness support, and research and development (United States Department of Homeland Security, 2011).

The National Preparedness Report provides a summary that conveys outcomes concerning the progress in regards to developing and maintaining the performance objectives essential to provide the core capabilities described in the National Preparedness Goal (United States Department of Homeland Security, 2011).

The two documents that provide the primary guidelines to disaster response from the federal government are the National Response Framework (NRF) and the National Incident Management System (NIMS). The NFR delivers the organization for a national-level policy concerning incident management while NIMS provides the template for the management of actual incidents. The two documents are to be used in unison with companion documents to provide a nationwide model to disaster response.

3. National Response Framework

The NRF is integrated under the NSS and focuses the homeland security effort on four main goals:

- Prevent and disrupt terrorist attacks.
- Protect the American people and our critical infrastructure and key resources.
- Respond and recover from incidents that do occur.
- Continue to strengthen the foundation to ensure our long-term success (United States Department of Homeland Security, 2008b).

The NFR outlines its framework through the core document and emergency support function (ESF) annexes, support annexes, incident annexes, and partner guides to create an information repository for the response framework that is inclusive of all levels of government and engages nongovernment organizations (NGOs) (United States Department of Homeland Security, 2008, p. 4). *ESF annexes* group federal resources and

capabilities into functional areas that are most frequently needed in a national response. *Support annexes* define critical supporting facets that are common to all events, such as financial management, citizen support teams and private sector coordination. *Incident annexes* speak to the exclusive aspects of how we respond to seven broad incident categories: biological, catastrophic, cyber, food and agriculture, nuclear/radiological, oil and hazardous materials, and terrorism incident law enforcement and investigation. *Partner guides* offer organized references defining key roles and action for local, tribal, state, federal, and private sector response partners (United States Department of Homeland Security, 2008, p. 4).

The core document outlines the roles and responsibilities of local, regional, state, tribal, federal, and private sector NGOs, so that a tiered level of response to disasters is implemented with a unified approach of cooperation. NRF recognizes that catastrophic events will always require the mitigation efforts of local emergency resources and that a tiered approach to disaster response is the most efficient and effective mechanism to mitigate the effects of the event.

> Incidents must be managed at the lowest possible jurisdictional level and supported by additional capabilities when needed. It is not necessary that each level be overwhelmed prior to requesting resources from another level. (United States Department of Homeland Security, 2008, p. 10)

To incorporate a scalable mechanism of disaster response that supports the efforts of local responders, the NRF has established a response doctrine with five key principles to support the division of responsibility between federal and state governments. The five key principles are:

- Engage in partnership.
- Tiered response.
- Scalable, flexible, and adaptable operational capabilities.
- Unity of effort through unified command.
- Readiness to act (United States Department of Homeland Security, 2008, p. 8).

The NRF has also established roles and responsibilities of key partners at the local, tribal, state, and federal levels who implement the NRF, as well as the private sector and NGOs (United States Department of Homeland Security, 2008, p. 15). The NRF plays a vital role in helping municipal leaders to organize resources within jurisdictions, including nearby jurisdictions and with the private sector and NGOs (example: American Red Cross). The key actors at the local level in establishing roles and responsibilities for disaster response are elected and appointed officials, the emergency manager for the jurisdiction, department and agency heads (fire, police, public health, EMS, etc.), and individual households. The elected or appointed officials have the responsibility to ensure a strong partnership, and relations are accomplished within the established jurisdiction, as well as response partners in other jurisdictions. This is usually accomplished by establishing an emergency manager for the jurisdiction that can focus on this mission and make recommendations to local leaders regarding strategy, policy, and planning for catastrophic events. This person has the day-to-day authority and responsibility for overseeing emergency management programs and activities (United States Department of Homeland Security, 2008, p. 16). The local emergency manager is assisted by and coordinates the efforts of support organizations such as the police department, fire department, public health, emergency medical services, etc., (United States Department of Homeland Security, 2008, p. 17). To incorporate philosophy of responsibility and resilience for the public, the NRF has established roles and responsibilities for individuals and households. Much of these incorporate the philosophy of self-reliance for planning and staying informed during catastrophic events. From these four identified partners at the local level of government the elected or appointed officials, department heads, and the emergency manager are the support mechanisms from an emergency-response viewpoint to prepare and mitigate the effects of a disaster. How these entities work with one another to develop response strategy within the region will determine the effectiveness of the response and if the NFR is incorporated.

The state level organization for roles and responsibilities, as outlined by the NRF, is similar to that at the local level of government. The elected official, who could be the governor of the state or chief executive of a U.S. territory, has the primary responsibility

to protect, plan, and coordinate resources within the state to prepare or respond to a disaster. At the state level, the governor also commands the state military forces, coordinates assistance from other states, coordinates assistance from the federal government to including if appropriate a Stafford Act Presidential declaration of an emergency or major disaster (United States Department of Homeland Security, 2008, p. 29).

To handle day-to-day issues related to homeland security, a state homeland security advisor serves as the advisor to the governor and can act as a liaison between the governor's office, the state homeland security structure, DHS, and other entities both inside and outside the state (United States Department of Homeland Security, 2008, p. 29). The advisor often heads a board comprised of representatives of pertinent state organizations, including public safety, emergency management, public health, the National Guard to plan, respond, and recover from catastrophic events. The state's office of emergency management is the agency responsible to prepare and coordinate disaster response resources within the state. This would include supporting local governments as needed or requested and coordinating assistance with other states and or federal government.

On the national level, the president of the United States leads the federal government response effort, but the overall coordination of federal response activities, if they are required are executed through the Secretary of Homeland Security (consistent with HSPD-5) (United States Department of Homeland Security, 2008, p. 24). Federal involvement during a catastrophic event occurs when the resources of the state is exceeded or is anticipated to exceed the local and state resources. This is done by the federal government's use of the framework to involve all essential resources to organize a federal response (United States Department of Homeland Security, 2008 HSPD-5). NRF has four clear benchmarks of when the federal government will undertake all federal incident management coordination: (1) a federal department or agency acting under its own authority has requested DHS assistance, (2) the resources of state and local authorities are overwhelmed and federal assistance has been requested, (3) more than one federal department or agency has become substantially involved in responding to the

incident, or (4) the secretary of DHS has been directed by the president to assume incident management responsibilities (United States Department of Homeland Security, 2008, p. 25).

The NFR is a blueprint and guideline for disaster response and planning that incorporates a unified approach to disaster management. The NFR sets guidelines that are flexible and scalable to accommodate the jurisdictions resources to meet the challenges in particular areas with distinct difficulties. The NRF is not an incident action plan that addresses particular requirements needed to organize resources to mitigate the event, rather it is a strategic overview of the response partners at the different levels of government and how they will interact with each other during planning and response to catastrophic events.

4. National Incident Management System

Lessons learned from the tragic events of 9/11 prompted our nation to develop a strategic plan to ensure a standardized method of disaster response nationwide. Homeland Security Presidential Directive 5 was established to enhance the ability of the United States to manage domestic incidents by establishing a single comprehensive national incident management system (Bush, 2003). As noted earlier, NIMS is a companion document of the NRF that outlines a national approach to disaster management that provides a systematic approach to disaster preparedness and management to mitigate scalable events at different levels of government to include various agencies that may be governmental or private sector organizations (United States Department of Homeland Security, 2008a).

The National Response Framework is an all-hazards framework that builds upon NIMS and describes additional specific federal roles and structures for incidents in which federal resources are involved (United States Department of Homeland Security, 2008a).

Homeland Security Presidential Directive 7 (HSPD-7) “Critical Infrastructure Identification, Prioritization, and Protection” and Presidential Policy Directive 8 (PPD-8) “National Preparedness” are also linked directly to NIMS. HSPD-7 incorporates NIMS to provide ongoing management of the National Infrastructure Protection Plan by providing

a unifying structure to prepare, deter, and mitigate man-made or natural disasters on identified critical infrastructures (United States Department of Homeland Security, 2011). PPD-8 integrates NIMS to develop a National Preparedness System that develops a common approach to preparedness that organizes around strategic components, which are: The National Preparedness Goal (NPG), The National Preparedness System (NPS), National Planning Frameworks (NPF), Federal Interagency Operational Plans (FIOP), Build and Sustain Preparedness, and a National Preparedness Report (NPR (United States Department of Homeland Security, 2008a, p. 11).

One component of NIMS is the Incident Command System (ICS), which is a systematic tool used for command, control, and coordination of emergency-response resources. ICS incorporates a standard management hierarchy by establishing an incident commander (IC), sections, branches, and groups/divisions. ICS is interdisciplinary and has an intended use as a method to integrate different disciplines, jurisdictions, and levels of government into an organization that can coordinate resources into a unified approach to emergency response. NIMS is also very adaptable and scalable—meaning the system can be used by multi-disciplines and scaled to an appropriate size as to not overload the span of control during different type events. The adaptability of the system allows it to be used on a broad number and type of incidents to include multijurisdictional events that overlap geographical boundaries or levels of government (United States Department of Homeland Security, 2008a). It manages to accomplish this by requiring all organizations involved with emergency response to utilize the same playbook, which is the National Incident Management System. This allows a standard organizational structure to be used for all emergency response (small, everyday and large, infrequent) and creates a shared philosophy on how to manage emergencies. By having mutual elements such as common terminology and information management, preparedness, resource management, command management, ongoing management and maintenance, it allows various organizations to interact because they understand the system, thus improving integration through cooperation (United States Department of Homeland Security, 2008a, pp. 7–8). Table 2.1 gives a broad overview of NIMS.

Table 2.1 Overview of NIMS

What NIMS is:	What NIMS is not:
A comprehensive, nationwide approach to incident management, including the Incident Command System, Multiagency Coordination Systems, and public Information.	A response plan.
A set of preparedness concepts and principles for all hazards.	Only used during large-scale incidents.
Essential principles for common operating picture and interoperability of communications and information management.	A communications plan.
Standardized resource management procedures that enable coordination among different jurisdictions or organizations.	Only applicable to certain emergency management/incident response personnel.
Scalable, so it may be used for all incidents (from day to day to large scale).	Only the Incident Command System or an organization chart.
A dynamic system that promotes ongoing management and maintenance.	A static system.
(United States Department of Homeland Security, 2008a, p. 6)	

The NSS, NFR, and NIMS have prefaced that in order to manage catastrophic events like the Murrah Building bombing, Hurricane Katrina, and the 9/11 attacks on the World Trade Center and the Pentagon, a coordinated approach to preparedness and response must be achieved. This has had a cascading effect on each state in terms of creating and implementing policy and strategies that affect the different jurisdiction within the state to plan, prepare, mitigate, and recover from disasters.

C. DISASTER RESPONSE STRATEGIES FOR THE STATE GOVERNMENT

1. State of Texas Emergency Management Plan (STEMP)

The state of Texas Emergency Management Plan is one of the primary documents that outline the organization in Texas for disaster preparedness and response, as well as

roles and responsibilities within the organization. The following summary outlines the lines of authority in the organization and how disaster response organization is structured.

Although the Texas governor has the ultimate responsibility for the safety and security of the people in Texas, the disaster planning and response within the state is accomplished through an organizational framework that reflects the recommendations outlined in State of Texas Emergency Management Plan, which also mirrors the NRF and NIMS. The governor delegates this authority to an individual that undertakes the role of director of Homeland Security for Texas with the additional responsibility as the director of Texas Department of Emergency Management (TDEM). The TDEM director has the responsibility to function as the chair of the State Emergency Management Council (SEMC), which comprises delegates from state agencies, boards, commissions, and organized volunteer groups (Texas Department of Public Safety, 2012). SEMC is structured as a matrix organization that includes 22 emergency support functions (ESF). ESFs take the lead in organizing the preparation and execution of the emergency function during disasters. The TDEM director advises the governor, lieutenant governor, and speaker of the House of Representatives on critical matters relating to homeland security and disasters (Texas Department of Public Safety, 2012). The assistant director chief, Texas Division of Emergency Management is responsible for the management of statewide emergency organization activities, running the state operations center, and for performing coordination and control of statewide resources during emergency response and recovery functions (Texas Department of Public Safety, 2012). The assistant director/ chief of TDEM has the added responsibility to serve as the state drought manager and chair of the State Emergency Response Commission (Texas Department of Public Safety, 2012). During large events that need state intervention to mitigate, predesignated disaster districts are established and managed by a disaster district committee (DDC) that is chaired by a Department of Public Safety (DPS) captain. The DDC is responsible for managing state emergency operations within a given geographic area. TDEM also has seven regional coordinators that liaison between TDEM and assist the DPS captain with

emergency-management concerns within their jurisdiction. The county judges and mayors are responsible for directing, controlling, and coordinating emergency operations within their jurisdictions.

Figure 2.2 Texas Disaster Districts (From Texas Department of Public Safety, 2012)

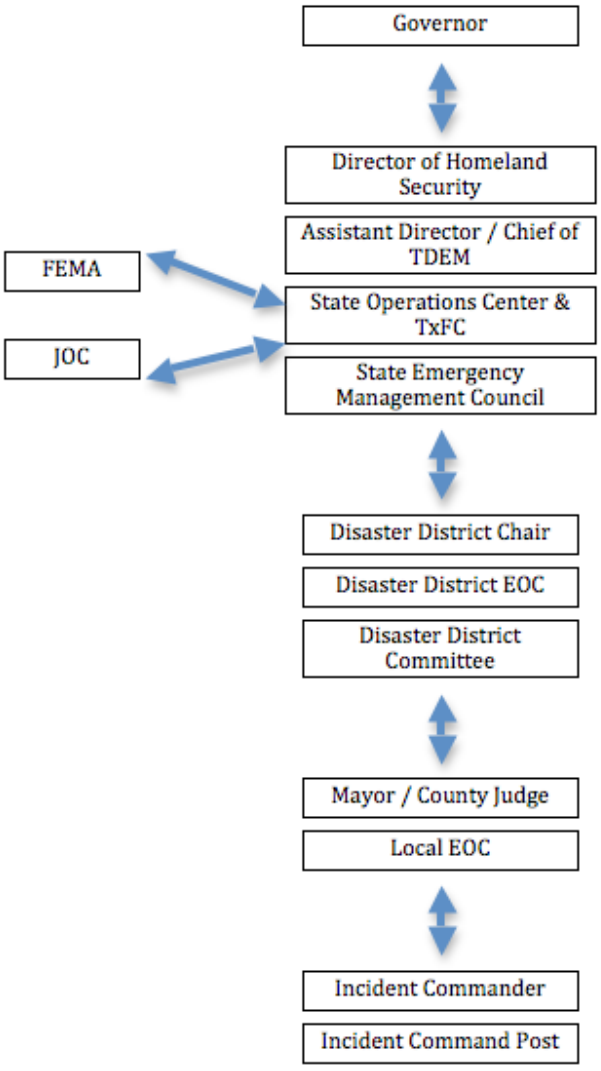

Figure 2.3 State and Local Emergency Management Organization Response Phase (From Texas Department of Public Safety, 2012)

2. Texas Homeland Security Strategic Plan

An example of a new state policy that reflects the objectives and priorities established in HSPD's-5, 7, and 8 is the Texas Homeland Security Strategic Plan. The plan is aligned with current and emerging federal guidance and principles including the *Quadrennial Homeland Security Review (February 2010), National Response Framework (January 2008), National Strategy for Homeland Security (October 2007),*

and the 37 target capabilities established in the *Department of Homeland Security Target Capabilities List (September 2007)*. It also aligns with the national objectives laid out in the *U.S. Department of Homeland Security Strategic Plan Fiscal Years 2008-2013* and other federal guidance such as the *National Response Framework*. The Texas strategic plan supports officials at all levels in fulfilling the homeland security and emergency management responsibilities assigned to them in Texas Government Code Chapters 411, 418, and 421 (Perry, 2010). A main topic that is continually reiterated throughout the document is the concept of regionalization and mutual aid.

> Texas will maximize the use of mutual aid to help ensure enough of the right resources are available when and where needed. Experience shows that rarely will one agency have all the resources needed to prevent terrorist attacks, combat organized criminal endeavors, or respond to major disasters. (Perry, 2010)

To further mutual aid statewide endeavors the 80th Texas Legislature passed Senate Bill 11 that supports key improvements in statewide mutual aid practices, emergency alert systems, and emergency vehicle operating standards, which advances the integrated aid response among local governments across the state (Perry, 2010). The regionalization concept is integrated into the states strategic homeland security planning throughout the 24 councils of government (COG) that are established within the state. The COGs are voluntary associations of local government formed under Texas law to deal with problems and planning that involve more than one county. This includes cooperative purchasing through government and planning and implementing regional homeland security strategies (Perry, 2010).

The State Homeland Security Strategy also addresses the risk, vulnerabilities, and threats associated with critical infrastructure within the state to include key resources and man-made and natural threats that could comprise them. To protect critical infrastructure within Texas, strategic goals were established with listed objectives for each. The 37 target capabilities put forth in the National Preparedness Guidelines were used as a guide to establish both the objectives and strategic goals.

Figure 2.4 Map of the Council of Governments in Texas (From Perry, 2010)

The three goals that are the foundation of the strategic plan are:

- Prevent terrorist attacks in Texas and prevent criminal enterprises from operating successfully in Texas.
- Reduce vulnerability to natural disasters, criminal and terrorist attacks and catastrophic events.
- Prepare to minimize damage through rapid, decisive response, and quickly recover from terrorist attacks and other disasters (Perry, 2010).

The Texas Homeland Security Strategic Plan provides an outline for how the state government is organized during disasters and provides clear lines of authority. As stated earlier the strategic plan also reflects the strategic priorities of the federal government as outlined in the above-mentioned documents and HSPDs. The strategic plan is broad enough to lend jurisdictions enough leeway to develop capabilities for the particular needs in their geographical area while also setting priority actions for each objective within the identified strategic goal.

3. Texas Department of Emergency Management Annex R, Search and Rescue

The search and rescue annex (Annex R) is one of 23 identified emergency support functions listed in the Texas Emergency Management Plan. The purpose of the Annex R is to delineate the framework, operational models, duties, and processes to accomplish search and rescue requirements in the state of Texas (Texas Department of Public Safety, 2006). Although local governments have the primary responsibility for initial search and rescue within their jurisdiction, when resources are overtaxed and additional expertise is needed to save lives, the environment, or property, a request for state assistance can be made through the jurisdictions Disaster District Committee (DDC) (Texas Department of Public Safety, 2006). The state of Texas has designated TX-TF1 as the primary state agency to accomplish ESF #9 search and rescue. The main focus for TX-TF1 is the ability to mitigate the effects of natural and man-made disasters that occur in an urban setting (although utilization in a rural area can also be accomplished) (Texas Department of Public Safety, 2006). TX-TF1 is also responsible for the deployment of water rescue teams during flooding events by coordinating local resources through the Texas Fire and Rescue Mutual Aid Plan. The Texas Fire and Rescue Mutual Aid Plan is developed and maintained by the Statewide Mutual Aid committee and outlines the organizational, monetary, and implementation practices for local jurisdictions to request and or provide mutual aid to jurisdictions that have agreed to partake in the statewide agreement (Texas Department of Public Safety, 2006). Interstate aid to provide or ask for assistance from other states is accomplished through the State Operations Center (SOC) in accordance with the Emergency Management Assistance Compact (EMAC) that Texas is a part (Texas Department of Public Safety, 2006).

Table 2.2 Primary Federal/State Functional Responsibilities (From Texas Department of Public Safety, 2012)

Federal ESF#	Function	Primary Federal Agency	Primary State Agency
1	Transportation	U.S Department of Transportation	DPS/Texas Highway Patrol
2	Communications	National Communications System/ Federal Emergency Management Agency	Communications Coordination Group
3	Public Works and Engineering	U.S. Army Corps of Engineers/Federal Emergency Management Agency	Texas Department of Transportation
4	Firefighting	U.S. Forrest Service	Texas Forrest Service
5	Emergency Management	Federal Emergency Management Agency	Texas Division of Emergency Management
6	Mass Care, Emergency Assistance, Housing, and Human Services	Federal Emergency Management Agency	Texas Division of Emergency Management
7	Logistics Management and Resource Support	General Services Administration/ Federal Emergency Management Agency	Texas Division of Emergency Management
8	Public Health and Medical Services	U.S. Department of Health and Human Services	Texas Department of State Health Services
9	Search and Rescue	Federal Emergency Management Agency/ Department of Defense	Texas Task Force 1 (Texas Engineering Extension Service)
10	Oil and Hazardous Materials Response	U.S. Coast Guard/Environmental Protection Agency	Texas Commission on Environmental Quality
11	Agriculture and Natural Resources	U.S. Department of Agriculture/ U.S. Department of Interior	Texas Health and Human Services Commission/Texas Department of Agriculture
12	Energy	U.S. Department Energy	Public Utility Commission of Texas
13	Public Safety and Security	U.S. Department of Justice	Texas Department of Public Safety
14	Long-Term Community Recovery	Federal Emergency Management Agency, U.S. Department of Agriculture, U.S. Department of Housing and Urban Development, and U.S. Small Business Administration	Texas Division of Emergency Management
15	External Affairs	Federal Emergency Management Agency	Department of Public Safety

4. Texas Intrastate Fire Mutual Aid System (TIFMAS)

Appendix 6 to Annex F (TIFMAS) of the STEMP outlines the procedures and parameters for response to catastrophic events of state significance involving fire, search and rescue, hazardous materials, and fire-based EMS (Texas Department of Public Safety, 2008). The concepts of operations for this document identify the available resources in each region, timeframe for deployment, and the ability to prestate resources in advance of a pending disaster. Annex R reiterates the STEMP concerning the organizational framework and processes when a local jurisdiction or state asks for assistance to deal with the effects of an event. Although TIFMAS (Texas_Intrastate Fire Mutual Aid System) reiterates the process and organization, the document has all the particulars concerning assignments of responsibilities, direction and control, administrative support (particularly reimbursement parameters), resource support, etc. While STEMP gives a broad perspective, TIFMAS is the document referenced concerning how the mutual aid system works holistically.

D. DISASTER RESPONSE STRATEGIES FOR THE LOCAL GOVERNMENT

The city of San Antonio (COSA) will be used as an example of local government representative of a major urban city in Texas.

1. The city of San Antonio Emergency Management Basic Plan

The COSA Emergency Management Basic Plan mimics the STEMP for the state of Texas in regards to strategic objectives, goals, and priorities. It provides overall direction for emergency management functions and a summation of the COSA methods of mitigation, preparedness, response, and recovery. The plan explains the COSA emergency response organization and delegates responsibilities for different emergency assignments. The plan is intended to provide an organizational outline for more specific tasks that are addressed in the functional Annexes that describe in more detail of who does what, when, and how. Organization and assignment of responsibilities that describe responsibilities and list participants in the Executive Group, Emergency Operations Group, and Emergency Support Group are explained along with the lines of succession

for mayor, city manager, and emergency manager in detail along with personnel who have authority to activate the Emergency Operations Center and ask for regional, state, or federal assistance (Trevino, 2011).

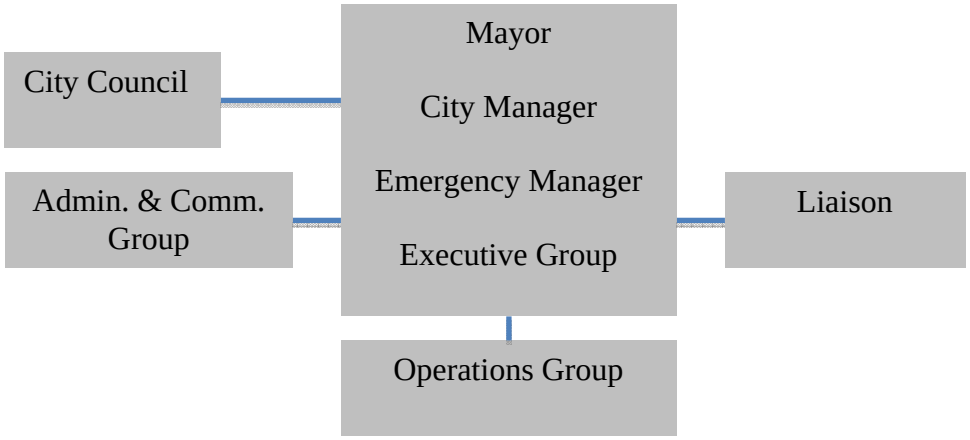

Figure 2.5 COSA Emergency Management Organizations

Table 2.3 COSA Emergency Management Organization (From Trevino, 2011)

Executive Group	**Operations Group**
Mayor	EOC Staff
Emergency Manager	Law Enforcement
City Attorney	Fire/HAZMAT
Fire Chief	EMS/Rescue
Police Chief	Regional Medical Operations Center (RMOC)
Community Initiatives	City Public Service
COSA Medical Health Director	Public Works
Public Works Director	Environmental Policy
Communications and Public Affairs	Parks and Recreation
Liaison Organizations	San Antonio Water system/Bexar Met.
Region 20/Schools	American Red Cross
Bexar County Emergency Mgt.	Metropolitan Health District/ RMOC/BCME/NDMS
AFEB/JBSA	Development services
DPS/RLO/AACOG	SAVOADs/211/Texas United Way Help Line
Bexar Metro 911	Salvation Army
FBI/LEO	AT&T
Support Group	VIA Transit System
Customer Service/311	Convention &Tourist services
Amateur Radio Volunteers	Purchasing & General Services
Amateur Radio Volunteers	Human Resources
	Aviation
	ITSD

2. City of San Antonio Office of Emergency Management Mutual Aide Agreements

Regional and local levels of government have also established regional mutual aide agreements to be implemented during catastrophic incidents. An example of this is the Alamo Area Council of Government Mutual Aide Agreement that allows assets of COSA to respond when requested in response to an event where assistance is required. The agreement states:

> The Department of Homeland Security/Office of Domestic Preparedness has mandated that jurisdictions must participate in regional mutual aid agreements in order to remain eligible to receive current and future homeland security related grant funding. (City of San Antonio, Texas, 2010)

This allows COSA to respond to and receive aid during events that overwhelm the emergency response resources within a jurisdiction (San Antonio Office of Emergency Management, 2011).

3. San Antonio Office of Emergency Management, Annex R, Search and Rescue Operations (SAR)

The purpose of Annex R for COSA is to outline the operational concepts, organizational responsibilities and lead agencies involved during SAR events within the jurisdiction of the city of San Antonio (San Antonio Office of Emergency Management, 2011).

The lead agency for SAR events is the SAFD. The SAFD SAR resources include:

- SAFD Fire and EMS operations
- Arson Division
- Special Operation Division
    - Special Operations Command
    - Hazmat Team
    - COSA HELO Team
    - Medical Special Operations Unit
    - Technical Rescue Team (TRT). The TRT is trained and equipped to respond to the following types of events:
        - High Angle Rescue
        - Confined Space Rescue
        - Trench Rescue
        - Cave Rescue
        - Swift-water Rescue
        - Boat Handling for Swift-Water Rescue
        - Structure Collapse
        - Wilderness Rescue
        - Industrial Rescue

E. SUMMARY

After examining the national approach to disaster response in the various strategic plans the federal government has created, one can see that a common concept is incorporated into all of them: cooperation. A cooperative, partnership approach at different levels of government and various agencies is part of a foundation that establishes a homeland security philosophy that promotes the bigger homeland security picture. The state and local governments in the state of Texas have done an excellent job in mirroring these concepts in their own strategic plans by injecting a philosophy of "regionalization" that promotes a tiered and partnership approach to disaster response and mitigation. As future trends concerning funding, hazards and threats emerge and change strategic visions, the foundation of partnership at the different levels of government that has been established will make adaptation and resilience to these future trends easier for emergency responders.

This literature review examines the disaster response strategies established by the federal, state, and local levels of government and how these strategies relate to the state of Texas for disaster response. This was done in order to understand what is expected for disaster response from a fire service perspective to perform an informed policy analysis on the current and alternate disaster response models.

III. METHOD

A. DEFINING THE PROBLEM

The local governments finance traditional fire response, while resources for regional response to mitigate the effects of disasters that are beyond the capabilities of local responders are funded at the state or federal levels of government. After the events of 9/11, the federal government established the Homeland Security Grant Program so that local jurisdictions could meet homeland security threats. One of the grant programs that funds emergency response capabilities for regional collaboration is the Urban Area Security Initiative (UASI). From 2003–2008, 60 of the highest density population areas were eligible for this grant program (Federal Emergency Management Agency, 2008). Over the past several years, UASI funding in many urban areas has been reduced or eliminated. This has caused sustainment problems for fire departments that have developed disaster response programs to mitigate catastrophic events in the region. To respond to this problem, a new model for allocating federal funds and organizing response agencies is proposed and evaluated to determine whether cost efficiency, response capabilities, and timeliness of response can be improved.

When looking at the different response models and how the fire service prepares for disasters, defining what knowledge, skills, and abilities are needed for the US&R teams will be examined. Examining national and adopted standards related to fire service and US&R capabilities will outline what capabilities are needed at the different levels of government in order to identify the policy that best streamlines and synergizes the various response elements into a response model that is adaptable and efficient.

Policy options analysis was used to evaluate the status quo and an alternative model for disaster response. This method was selected to evaluate the disaster response approaches in the state of Texas by researching the contextual factors of current disaster response models. The state of Texas was used because of the author's familiarity and the

geographical challenges concerning size and population density. The policy analysis defines problems, evaluates criteria, identifies and evaluates alternative policies, and makes a policy recommendation.

By conducting a policy analysis of current disaster response options, a better understanding of the efficiency and effectiveness of different preparedness methods can be gleaned. This involves the collection and analysis of disaster response plans at different levels of government within Texas, as well as the traditional emergency-response capabilities of fire departments that have the capabilities of responding to special events, which are catastrophic. How disaster response and preparedness is geographically organized at the different levels of government will also be researched to glean the most proficient response model to respond to disasters.

B. DATA SAMPLE AND COLLECTION

The Texas disaster response system will be the object of study. Texas is the second largest state in the United States geographically with over 268,820 square miles and also the second most populous with a growing population of 25.7 million residents—it, therefore, provides greater response challenges geographically than most other states in the union. Texas has three cities with populations exceeding one million: Houston, San Antonio, and Dallas. These three rank among the 10 most populous cities in the United States. Austin, Fort Worth, and El Paso are among the 25 largest cities in the U.S with populations of more than 500,000 people. Major metropolitan areas in Texas with populations greater than one million include: Dallas-Fort Worth-Arlington, Houston, Sugar Land, Baytown, San Antonio-New Braunfels, and Austin-Round Rock-San Marcos (United States Census Bureau, 2012).

C. DATA ANALYSIS

The following policy options were evaluated for this research.

- *Policy Option A, Maintaining the Status Quo*

The current disaster response model in the state of Texas has a centralized Texas Task Force 1 (TX-TF1) as the primary organization to mitigate the effects of disasters.

TX-TF1 utilizes fire service personnel from many jurisdictions around Texas as a means to augment its response force. When called to respond, TX-TF1 initiates a recall of personnel to College Station, Texas, which is its headquarters. From there, the needed resources are organized and dispatched to mitigate the effects of the disaster.

- *Policy Option B: Decentralized Disaster Response Model*

Policy Option B is a decentralized approach to disaster response at the state level. This option uses Type II US&R teams[2] within the identified areas that are funded by HSGP. These teams would augment personnel assigned to the Type I USAR team funded by FEMA, which is Texas Task Force One (TX-TF1).[3] This approach is utilized in the state of Texas during flooding events to activate boat teams within a swift-water strike team in different areas of the state. Because funding is declining, an alternative model that streamlines funding and develops programs that are self-sustaining is needed to keep or improve disaster response capabilities at local, state, and federal levels.

D. EVALUATION CRITERIA

The criteria used to evaluate each option's potential for success relates to an identified list of response capabilities for each policy option. Identified capabilities for each policy option are the following: response flexibility, regional collaboration, proficiency of responder KSAs, how timeliness the response is to the disasters, and cost efficiency.

a. **Response flexibility** refers to how versatile and adaptable the response model is when responding to different types and size events at the local, regional, and state level of government. This directly plays into how resilient the model is when examining how the state of Texas will adapt and respond during multiple events with reduced capabilities. The research will specifically compare the positives and negatives of using a centralized or decentralized disaster response framework.

[2] A 22-person urban search and rescue team nationally qualified to perform search and rescue operations and is self sustained for the first 24 hours (*Texas Task Force 1: Urban Search and Rescue Response System*, 2012).

[3] This is a 60-person urban search and rescue team nationally qualified to perform search and rescue operations and is self sustained for 24-hour operations for a minimum of 14 days before requiring personnel rotations (*Texas Task Force 1: Urban Search and Rescue Response System.*2012).

b. **Regional collaboration** refers to how the fire departments and different disaster response organizations in a geographic region have (or have to) partner with one another to meet the disaster response needs in the region through teamwork and cooperation. This will be evaluated by researching how often these different organizations respond, prepare, and share cost of disaster response at the different levels of government.

c. **Proficiency of responder KSAs** refers to the knowledge base and ability to perform in events that require specialized knowledge and skill to mitigate the effects of a catastrophic event. To measure KSA proficiency, training hours per discipline, quality of instruction, training environment, and sustainability of the training programs will be assessed by comparing the number of hours trained. Another factor that will be considered will be if the KSAs needed for the identified KSAs for disaster response are part of their primary job description. Researching the number of hours the centralized model and local jurisdictional teams complete annually for each discipline, and whether these KSAs are part of their job description with frequent use will accomplish this. The quality of the training will be determined by training facilities, support, and adherence to national standards for the discipline in question.

d. **How timely the response to the disaster** refers to how fast a disaster response team with its cache can get to the scene of an event to render aide and glean information concerning the event to mitigate the effects of the disaster at the local, regional, and state levels of government within the state of Texas. The timeliness of response will be determined by comparing the centralized and decentralized models that are currently being used by TX-TF1 for USAR and swift-water deployments.

e. **Cost efficiency** refers to the cost to maintain a disaster response program for local, regional, and state catastrophes. Researching how much money the state of Texas has used for disaster preparedness within the identified councils of governments will provide the information to do a cost vs. benefit analysis. How often the resources were used at the local, regional and state level and the cost associated will be used as the criteria.

A matrix with a rating scale of Excellent, Good, Marginal, and Poor will be used.

Table 3.1 Disaster Response Criteria Matrix

Policy	Response flexibility	Regional collaboration	Proficiency of responder KSAs	Response timeliness to disasters	Cost Efficiency
A **Status Quo**	Excellent Good Marginal Poor	Excellent Good Marginal Poor	Excellent Good Marginal Poor	Excellent Good Marginal Poor	Excellent Good Marginal Poor
B **Decentralized**	Excellent Good Marginal Poor	Excellent Good Marginal Poor	Excellent Good Marginal Poor	Excellent Good Marginal Poor	Excellent Good Marginal Poor

1. Response flexibility

   a. An "Excellent" rating for response flexibility would provide the most latitude for the response model to adapt and respond to multiple catastrophic events of different types, sizes, and scope.

   b. A "Good" rating for response flexibility would provide moderate latitude for the response model to adapt and respond to at least three catastrophic events of different types, sizes, and scope.

   c. A "Marginal" rating for response flexibility would provide the limited latitude for the response model to adapt and respond to two catastrophic events of different types, sizes, and scope.

   d. A "Poor" rating for response flexibility does not provide latitude for the response model to adapt and respond to catastrophic events of different types, sizes, and scope.

2. Regional collaboration

   a. An “Excellent” rating for regional collaboration demonstrates that the disaster response policy facilitates the expansion of coordination, planning and response by bringing together local, regional, and state disaster response partners to transform local response resources into regional and state disaster response capabilities.

   b. A “Good” rating for regional collaboration demonstrates that the disaster response policy shows progress towards the development of coordination, planning and response by bringing together local, regional, and state disaster response partners to transform local response resources into regional and state disaster response capabilities.

   c. A “Marginal” rating for regional collaboration demonstrates that the disaster response policy does not hinder nor facilitate the coordination, planning and response by bringing together local, regional, and state disaster response partners to transform local response resources into regional and state disaster response capabilities.

   d. A “Poor” rating for regional collaboration demonstrates that the disaster response policy hinders the coordination, planning and response by bringing together local, regional, and state disaster response partners to transform local response resources into regional and state disaster response capabilities.

3. KSA proficiency

   a. An “Excellent” rating for KSA competence indicates that the disaster response policy provides a mechanism for responders to perform or train regularly on technical skills, abilities, and subject matter knowledge in the related job field for disaster response at an outstanding level of proficiency.

   b. A “Good” rating for KSA competence indicates that the disaster response policy provides a mechanism for responders to perform or train technical skills, abilities, and subject matter knowledge in the related job field for disaster response on a monthly basis and that results in an acceptable level of proficiency.

   c. A “Marginal” rating for KSA competence indicates that the disaster response policy provides a limited mechanism for responders to perform or train technical skills, abilities, and subject

matter knowledge in the related job field for disaster response. Marginal denotes the minimum amount of initial and recurrent training recommended by national standards for the specific KSAs.

d. A “Poor” rating for KSA competence indicates that the disaster response policy does not provide a mechanism for responders to perform or train technical skills, abilities, and subject matter knowledge in the related job field for disaster response. Poor denotes the minimum amount of initial and recurrent training by national standards for the specific KSAs have not been met.

4. Response time to disasters

a. An “Excellent” rating for response timeliness to disasters demonstrates that the disaster response policy provides a method to dispatch resources to mitigate the effects of a catastrophic event in the least amount of time by utilizing a tiered method of response (local, regional, state, federal).

b. A “Good” rating for response timeliness to disasters demonstrates that the disaster response policy provides a method to dispatch resources to mitigate the effects of a catastrophic event in a timely manner by utilizing a tiered method of response (local, regional, state, federal).

c. A “Marginal” rating for response timeliness to disasters demonstrates that the disaster response policy provides a limited method to dispatch resources to mitigate the effects of a catastrophic event and does not use a tiered method of response (local, regional, state, federal).

d. A “Poor” rating for response timeliness to disasters demonstrates that the disaster response policy provides does not provide a method to dispatch resources to mitigate the effects of a catastrophic event.

5. Cost efficiency

a. An “Excellent” rating for cost efficiency demonstrates that the disaster response policy would lower costs while maintaining or increasing response capabilities.

b. A “Good” rating for cost efficiency demonstrates that the disaster response policy would maintain costs while maintaining or increasing response capabilities.

c. A "Marginal" rating for cost efficiency demonstrates that the disaster response policy would increase costs while maintaining response capabilities.

d. A "Poor" rating for cost efficiency demonstrates that the disaster-response policy would increase costs while decreasing response capabilities.

A strategy canvas for the disaster response criteria is used as a diagnostic and action framework that compares the identified standards for each policy. This allows the reader to better understand the strengths and weaknesses of each policy by establishing a visual reference (Chan & Mauborgne, 2005).

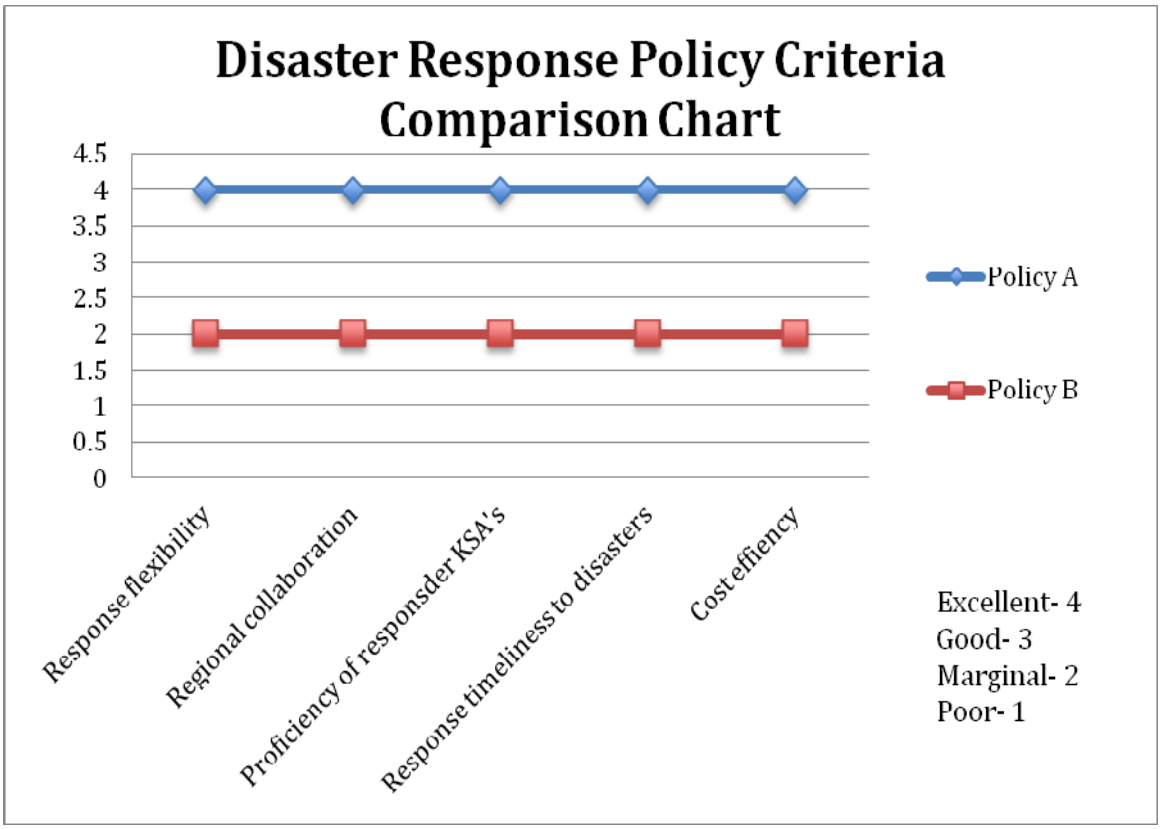

Figure 3.1 Disaster Response Policy Criteria Comparison Chart (Example)

IV. DEFINING DISASTER RESPONSE CAPABILITIES AND REQUIREMENTS FOR THE FIRE SERVICE

A. INTRODUCTION

In order to compare different disaster response policies for a particular area of expertise, an examination of established standards and practices must be accomplished to establish a baseline to compare and reference during the policy analysis. The following chapter outlines and defines national practices and standards in disciplines specific to disaster response in the fire service. The information provided in this chapter will provide a reference when comparing the two different policies in this thesis. Table 4.1 lists the US&R regulations and requirements for the different on TX-TF1. The matrix demonstrates the correlation between the needed KSAs for disaster response for local and state response agencies.

B. BACKGROUND

It is important to have an understanding of what response capabilities are needed by fire service personnel to respond to natural and man-made disasters in order to understand how disaster response could be organized and funded at the different levels of government.

Because not all emergencies involve putting out fires, the fire service has created specialties within the fire service to meet the challenges posed by large catastrophes that require specialized training to mitigate (Lohrke, 2010). These increased capabilities can be vital to the success of response operations that involve automobile accidents, train wrecks, boat accidents, airplane crashes, elevator emergencies, high-angle, confined space rescues, trench cave-ins, building collapses, tornadoes, hurricanes, earthquakes, water rescues, hazardous materials incidents, and now terrorist attacks (Norman, 2009). Because the cost of training and equipment is expensive, the fire services in most jurisdictions do not have the budget to train all firefighters in specialized skills that are

used during disaster response (Norman, 2007). This is also an expense to the state and federal levels of government because these entities often fund special teams that can travel and augment local response.

The following chapter examines the skills within the fire service, specifically KSAs used on fire department special teams such as hazmat and technical rescue that are also used on state and federal task forces to mitigate the effects of catastrophes. This section will also examine the standards used by the authority having jurisdiction (AHJ) to certify personnel in these specialized areas of expertise that ensure emergency response personnel are following adopted practices to include state and federal regulations and nationally recognized industry standards. This will be used to explain the requirements, effort, and cost associated with providing these specialized services to the public in order to provide the information needed to sustain these types of response capabilities efficiently.

C. STANDARDS FOR TECHNICAL RESCUE AND HAZMAT

There are few published sources that specifically address fire department special operations because each jurisdiction determines what KSAs (Knowledge, Skills, and Abilities) are routine or special for each fire department. Most reference material is developed and organized by the particular area of capability (hazmat, technical rescue, airport firefighting, tactical medicine, etc.) and is considered a separate fire department special operation expertise. Much of the literature written comes from industry-related literature to include trade journals, books, OSHA regulations, NFPA (National Fire Protection Association) and after action reports (AARs) that critique large events. Certification for different fire department disciplines ultimately lies with the AHJ and the state government that regulates the standards for firefighting and related areas within the state. Third-party certification entities and educational organizations can provide endorsement for fire service certification programs and higher education fire related degree plans to increase the level of competence to ensure participating organizations are adhering to nationally recognized standards. The following entities play a primary role in

the certification process for the San Antonio Fire Departments (SAFD) Technical Rescue and Hazardous Material Response Teams.

1. Texas Commission on Fire Protection (TCFP)

The chief regulatory commission for standards on firefighting and other related disciplinary certifications is through the Texas Commission on Fire Protection (TCFP). This supervisory authority administers statewide fire service standards and offers education and assistance to the fire service, as defined by Chapter 419 of the Texas Government Code (TCFP, 2010b). In the state of Texas, paid fire protection personnel must be certified through the TCFP to ensure that the required KSAs are taught and tested. This is to provide a margin of safety for fire personnel and compliance of fire departments with state laws and regulations (TCFP, 2007a). Continuing education (CE) hours are required annually by the Texas Commission on Fire Protection to keep personnel certifications active and the department in compliance with all TCFP rules. The TCFP requires a minimum of 20 hours continued education for structural firefighters, along with an additional 10 hours for hazardous materials technicians (TCFP, n.d.b).

2. International Fire Service Accreditation Congress (IFASAC)

IFASAC is a nonprofit peer-driven organization authorized by the Board of Regents of Oklahoma State University that accredits fire service certification programs and higher education fire related degree programs (International Fire Service Accreditation Congress [IFSAC], 2010). The goal of this governing body is to increase the level of professionalism in the fire service by verifying that participating programs are adhering to nationally recognized standards, such as the National Fire Protection Association Standards (IFSAC, 2005, pp. 1–3).

3. National Fire Protection Agency (NFPA)

A primary reference for certification standards for technical rescue and hazmat KSAs are the NFPA regulations. NFPA is dedicated to supporting consensus codes and standards that afford education and research for fire and related safety issues. A nonprofit association, NFPA has more than 65,000 members and is staffed by more than 5,000

volunteers. Many of these volunteers are part of technical committees. These committees develop standards that promote a high level of safety through competency for all fire service organizations (National Fire Protection Agency, 2012). Although NFPA standards have to be adopted by an organization in order to extend beyond recommended practices, these standards are recognized as the industry standards in which universities and emergency response organizations refer to for training and certification criteria.

4. Occupational Safety and Health Administration (OSHA)

Occupational Safety and Health Administration is an agency within the United States Department of Labor whose mission is to assure a safe and healthful working condition for working people by setting and enforcing standards and providing training, outreach, education and assistance (United States Department of Labor). Although OSHA regulations are written for the working community and not emergency responders, they provide guidance to ensure safe working practices to related fields within the fire service.

D. TECHNICAL RESCUE CERTIFICATION STANDARDS

There are three NFPA standards that directly apply to technical rescue criterions that ensure a high level of safety through competency of individual skills and design performance for equipment. The technical rescue standards for *NFPA are 1006 Rescue Technician Professional Qualifications, 1670 Operations and Training for Technical Search and Rescue Incidents*, and *1983 Life Safety Rope and Equipment for Emergency Services.* OSHA also has established regulations that fall into the realm of technical rescue. The two standards are: 29 CFR 1910.146 *Permit Required Confined Space* and *29 CFR 1926.652. Subpart P Requirements for Protective Systems (Trench).*

1. 1006 Rescue Technician Professional Qualifications

The goal of NFPA 1006 Rescue Technician Professional Qualifications is to establish the minimum job performance requirements necessary for fire service and other emergency response personnel who may be called to these types of incidents. The standard only recognizes one level of competency and that is at the technician level. Once a person has shown the skills and competency required of a specific discipline, that

person is referred to as a rescue technician. The term “operations and awareness” are referenced in *NFPA 1670 Operations and Training for Technical Search and Rescue Incidents* and denotes the organizational capability and not a particular individual (National Fire Protection Association, 2008). NFPA 1006 addresses nine different disciplines for technical rescue. They are (National Fire Protection Association, 2008):

- Rope Rescue
- Water Rescue
- Vehicle and Machinery Rescue
- Confined Space Rescue
- Structural Collapse Rescue
- Trench Rescue
- Subterranean Rescue
- Dive Rescue
- Wilderness Rescue

2. 1670 Operations and Training for Technical Search and Rescue Incidents

The intent of NFPA 1670 Operations and Training for Technical Search and Rescue Incidents is to assist the authority having jurisdiction (AHJ) in recognizing and establishing levels of functional competence for conducting functions that require technical search and rescue (National Fire Protection Association, 2009). Assessing the operational capability needed to conduct technical search and rescue operations safely and effectively based on the hazard identification, risk management, level of training, and available resources. There are three levels of operational capabilities for technical search and rescue.

- Technician – The technician level represents the capability of *organizations* to respond and conduct technical search and rescue operations.
- Operations – The operations level represents the capability of *organizations* to identify hazards and support technical search and rescue operations.

- Awareness – The awareness level represents the ability to identify hazards associated with a particular environment (National Fire Protection Association, 2009).

With the exception of rope rescue, these established technical rescue disciplines identify a working environment in which the standard specifically addresses. The standard also incorporates discipline-training matrixes that outlines which of the identified disciplines are prerequisites to other disciplines. An example of this would be the prerequisite of rope rescue for confined space since confined space utilizes ropes and rigging for specific skill sets within this area of expertise.

3. NFPA 1983 Life Safety Rope and Equipment for Emergency Services

Manufacturers for minimum design performance, testing and certification requirements primarily utilize the NFPA 1983 standard. This standard is not a "use" standard, but instead a reference to use for understanding the equipment used in the industry. NFPA 1983 identifies labeling, design and construction requirements, performance and testing requirements for system components (National Fire Protection Association, 2012).

4. 29 CFR 1910.146 Permit Required Confined Space

The OSHA permit required confined space code contains requirements for practices and procedures to protect employees in general industry from the hazards of entry into permit-required confined spaces. Regulation 1910.146 became law on 15 April 1993 and is a regulation that is written and enacted to protect general industry employees when making entry into confined spaces (United States Department of Labor, 2011). In its simplest form, 1910.146 contains requirements for practices and procedures to protect employees in general industry from the hazards of entry into permit-required confined spaces. It requires employers to provide a program for controlling, protecting and regulating entry into confined spaces, (permit space program). Employers must have written procedures for preparing and issuing permits for entry and for returning the permit space to service following termination of entry, (permit system).

Because the regulation is not emergency response centered, it does not address many of the technical issues that rescuers may face. It is the responsibility of the emergency response organization to extract the important information in 29 CFR 1910.146, combine it with our own experience and devise the safest methods and practices to effectively perform confined space rescues (CSR).

5. 29 CFR 1926.652. Subpart P Requirements for Protective Systems (Trench)

Requirements for Protective Systems states that each employee in an excavation shall be protected from cave-ins by an adequate protective system that complies with the standard. General requirements are those items required during construction operations that a competent person must consider and act upon. Trenches are usually no more than 15 feet deep and the majority of fatal trench accidents occur in trenches less than 12 feet (United States Department of Labor, 1994). Because of the associated hazard related to the depth of the trench, OSHA requires a professional engineer to inspect and approve the shoring for trenches greater than 20 feet (United States Department of Labor, 1994). All trenches must be protected before entries except for those made entirely of stable rock or those that are less than five feet in depth and inspected by a competent person who has found no indication of a potential cave-in. Anything more than five feet in depth, including the height of the spoil pile must be protected. Spoil piles must be set back at least two-feet from the lip of the trench to reduce the possibility of a spoil pile collapse. Trenches four feet or greater in depth must have a means of egress every twenty-five feet and must be tested for atmospheric hazards before entry (United States Department of Labor, 1994).

E. HAZARDOUS MATERIALS CERTIFICATION STANDARDS

There are three organizations that have established recognized standards associated with hazardous material response. They are NFPA, TCFP, and OSHA. The two NFPA standards used to determine the level of proficiency for responders and determine the level of competence for a specific tactics concerning hazardous materials or WMD are: *NFPA 472 Standard for Competence of Responders to Hazardous*

Materials/Weapons of Mass Destruction (2008) and NFPA 473 Standard for Competence for EMS Personnel Responding to Hazardous Materials/Weapons of Mass Destruction (2008).

While NFPA regulations outline the KSAs for different levels of competencies for hazardous material responders, the TCFP provides the certification authority by which personnel responding to a hazardous material incident as an emergency responder have to meet in the state of Texas. OSHA federal regulations establish minimum safe working practices when dealing with hazardous materials. *OSHA 29 CFR 1910.120 Hazardous Waste Operations and Emergency Response* is the OSHA standard used for this purpose.

1. OSHA 29 CFR 1910.120 Hazardous Waste Operations and Emergency Response

OSHA 29 CFR 1910.120 is the federal standard that establishes specific requirements for clean up, working with, and responding to hazardous materials. The OSHA regulation contains necessities for practices and procedures to protect employees in the general industry and emergency response from risks associated with hazardous materials. In its simplest form, 1910.120 provides guidance for personnel at risk of being exposed and hurt from hazardous materials. The following are some of the major components of the regulation:

- Safety and Health Program (OSHA 29CFR 1910.120[b])
- Site Characterization and Analysis (OSHA 29CFR 1910.120[c])
- Site Control (OSHA 29CFR 1910.120[d])
- Training (OSHA 29CFR 1910.120[e])
- Medical Surveillance (OSHA 29CFR 1910.120[f])
- Monitoring (OSHA 29CFR 1910.120[h])
- Decontamination (OSHA 29CFR 1910.120[k])
- Emergency Response Program to Hazardous Substance Releases (OSHA 29CFR 1910.120[q])

OSHA 29CFR 1910.120 also has five associated appendixes. They are:

- Appendix A – Personal protective equipment test methods
- Appendix B – General description and discussion of the levels of protection and protective gear
- Appendix C – Compliance guidelines
- Appendix D – References
- Appendix E – Training Curriculum Guidelines (non-mandatory)

From an emergency response perspective concerning this regulation, emergency response organizations that follow NFPA regulations regarding hazardous materials and WMD should be in compliance of OSHA 29CFR 1910.120[q].

2. NFPA 472 Standard for Competence of Responders to Hazardous Materials/Weapons of Mass Destruction (2013)

NFPA 472 establishes the minimum job performance requirements necessary for fire service and other emergency response personnel who could respond or come across these types of incidents during their normal course of work. The original standard was established in 1986 and was meant to help reduce the number of accidents, injuries, and illnesses during response to hazardous materials/WMD incidents and to avoid exposures thereby decreasing the likelihood of deaths, sickness, and disabilities to personnel that respond to these incidents (National Fire Protection Association, 2013a). The standard addresses the training requirements for multiple levels of competency and specialties to include:

- Competencies for Awareness Personnel (NFPA 472, Chapter 4)
- Core Competencies for Operations Level Responders (NFPA 472, Chapter 5)
- Core Competencies for Operations Level Responders Assigned Mission-Specific Responsibilities (NFPA 472, Chapter 6)
- Competencies for Technician Level Responders (NFPA 472, Chapter 7)

- Competencies for Incident Commanders (NFPA 472, Chapter 8)
- Competencies for Specialist Employees (NFPA 472, Chapter 9)
- Competencies for Hazardous Materials Officers (NFPA 472, Chapter 10)
- Competencies for Hazardous Materials Safety Officers (NFPA 472, Chapter 11)
- Competencies for Hazardous Materials Technicians with a Tank Car Specialty (NFPA 472, Chapter 12)
- Competencies for Hazardous Materials Technicians with a Cargo Tank Car Specialty (NFPA 472, Chapter 13)
- Competencies for Hazardous Materials Technicians with a Intermodal Tank Car Specialty (NFPA 472, Chapter 14)
- Competencies for Hazardous Materials with a Marine Tank and non-Tank Vessel Specialty (NFPA 472, Chapter 15)
- Competencies For Hazardous Materials Technicians With A Flammable Liquids Bulk Storage Specialty (NFPA 472, Chapter 16)
- Competencies for Hazardous Materials Technicians with a Flammable Gases Bulk Storage Specialty (NFPA 472, Chapter 17)
- Competencies for the Hazardous Materials Technician with a Radioactive Material Specialty (NFPA 472, Chapter 18)

3. NFPA 473 Standard for Competence for EMS Personnel Responding to Hazardous Materials/Weapons of Mass Destruction (2013)

NFPA 473 addresses the levels of proficiency necessary of EMS personnel who may in the course of their duties respond to hazardous material/WMD incidents. The original standard was established in 1986 and was specifically meant to address requirements for basic life support (BLS) and advanced life support (ALS) in a prehospital setting to enhance the safety and protection of response personnel to include all components of EMS (National Fire Protection Association, 2013b). The standard addresses the training requirements for multiple levels of competency and specialties to include:

- Competencies for Hazardous Materials/ WMD BLS Responder (Chapter 4)
- Competencies for Hazardous Materials/ WMD ALS Responder (Chapter 5)
- Competencies for Hazardous Materials/ WMD ALS Responder Assigned Mission Specific Responsibilities (Chapter 6)

4. Texas Commission on Fire Protection Certification for Hazardous Materials

The TCFP's manual provides the certification curriculum for hazardous materials technician in accordance with *NFPA 472 Standard for Competence of Responders to Hazardous Materials/Weapons of Mass Destruction (2008)* (TCFP, 2010a). The TCFP curriculum outlining the competencies for hazardous materials technicians mirrors the NFPA 472 standard almost exactly and is the basis for hazardous materials technician education and training. The training curriculum for hazardous materials technician has been accredited by IFSAC, which implies that this program is being taught to a higher nationally, accepted criteria in order to meet certification requirements.

Another requirement established by TCFP is that all persons seeking hazardous materials technician certification through TCFP must hold a structural firefighter certification prior to the certification being awarded (Texas Commission on Fire Protection [TCFP], 2007a). Many fire departments use this to their advantage and develop a "dual role model" for hazmat teams meaning that the personnel assigned to a hazmat team would be expected to respond to the traditional emergencies as well as hazmat and WMD events.

F. THE CORRELATION OF FIRE DEPARTMENT SPECIAL OPERATIONS AND URBAN SEARCH AND RESCUE TEAMS

The Federal Emergency Management Agency (FEMA) developed the task force concept to provide a level of technical response for large-scale events in the United States. Currently, there are 28 FEMA funded urban search and rescue (USAR) task force teams in the United States (United States Federal Emergency Management Agency, 2012). These teams are part of the state and federal disaster response assets that are also

sponsored in part by emergency response organizations within the particular state that provide responders to support the initiative.

Table 4.1 Certification Matrixes for USAR Position Requirements

USAR Position Requirements									
	Certification Regulations and Guidelines								
TX-TF1 Position	OSHA 29 CFR 1910.120	OSHA 29 CFR 1910.146	OSHA 29 CFR 1926.652 subpart P	TCFP Certification	NFPA 472	NFPA 473	NFPA 1006	NFPA 1670	NFPA 1983
Hazmat Specialist	X			X	X				
Heavy Equipment and Rigging Specialist		X					X	X	X
Logistics Specialist									
Medical Specialist		X					X	X	X
Medical Team Manager		X					X	X	X
Rescue Specialist		X	X				X	X	X
Structural Specialist		X					X	X	X
Technical Information Specialist									
Technical Search Specialist		X	X				X	X	X
Canine Search Specialist		X					X	X	X
Communications Specialist									
San Antonio Fire Department Special Team									
HMRT	X	X		X	X	X			
TRT		X	X				X	X	X
TX-TF1 web page http://usar.tamu.edu/join/Pages/default.aspx									

USAR teams have the capability to perform vital functions during times of disasters whether man-made or natural. USAR teams are divided into six skill components that include a command structure, rescue, medical, hazmat, logistics, and search (*Texas Task Force 1: Urban Search and Rescue Response System*, 2012). When comparing the skills and capabilities associated with USAR task forces (command structure, rescue, hazmat, and search), these KSAs are very similar to those used by the fire service and those related to fire department special operations. Because of this familiarity, fire service personnel predominantly play a lead role as team members on different task forces around the nation.

As stated earlier, the fire service has recognized a need to meet the challenges of disaster response that are beyond the traditional fire rescue skill set. To contend with these types of high-risk low-frequency events, the fire service has created “special teams” who are trained to deal with these special incidents. A good definition for fire department special operations is “any function other than basic fire suppression that involves specialized training to save lives and mitigate the effect of the emergency incident (Lohrke, 2010).

By defining the disaster response capabilities and requirements for the fire service and comparing them to established response capabilities that are used by US&R teams, a better perspective of how local response capabilities can be incorporated into state and national responses to disasters can be achieved.

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V. FINANCING DISASTER RESPONSE

A. PREFACE

One of the biggest homeland security challenges for local, state, and federal levels of government is how to develop a cost efficient strategy that will reduce America's vulnerability to natural and man-made disasters. By examining the cost associated with various aspects of disaster response and how these capabilities are funded, we can glean information needed for a policy analysis. This compares the current policies that outline response capabilities and associated costs to other models in order to explore the most cost efficient and effective models for disaster response at the state level of government. The mission of homeland security can be divided into three broad areas for the purpose of analysis and budgeting: (1) prevention and disruption of terrorist attacks; (2) protection of the American people, critical infrastructure, and key resources; and, (3) responding to and recovery from natural and man-made events (Dancs, 2011). This chapter will concentrate on the analysis of cost for #3, responding to and recovery from natural and man-made events. This will include an analysis of federal funding for homeland security since 9/11, a hypothesis concerning punctuated equilibrium theory that may explain and forecast homeland security funding trends, disaster response funding in Texas, the cost to train disaster response personnel, and a conclusion of the information analyzed.

B. HOMELAND SECURITY FUNDING OVERVIEW

In response to the attacks of September 11, 2001, the Department of Homeland Security (DHS) was created, with the responsibility to protect and respond to natural and man-made events. DHS became operational in 2003, absorbing 23 existing federal organizations from nine other federal departments. It established five divisions: (Homeland Security Act of 2002)

- Border and Transportation Security
- Emergency Preparedness and Response
- Information Analysis and Infrastructure Protection

- Science and Technology
- Management

Since the attacks of September 11, 2001, the budget for homeland (national) security has increased from $20.7 billion in 2001 to $69.1 billion in 2011, peaking in 2009 at $74 billion (United States. Office of Management and Budget, 2010), which is an average cost of $214 per person in the United States annually (United States Census Bureau, 2012). Most federal funding to prepare local governments for disaster response comes from grants established under Homeland Security Grant Program (HSGP) and allocated by FEMA. HSGP currently (2012) consists of three different subprograms of which two are designed to meet emergency response core capabilities. The emergency preparedness grants are the Urban Area Security Initiative (UASI) and the state Homeland Security Program (SHSP). The Metropolitan Medical Response System (MMRS) was eliminated in 2012 but will be examined, since it was a major component to prepare emergency medical systems for disasters. The Operation Stonegarden subprogram is the third HSGP subprogram and is devised to improve coordination between local, state, and federal law enforcement organizations to protect the borders with Mexico, Canada, and international waters.

By examining the annual budgets for these grant programs that support local disaster response programs, trends can be discovered and used to create policy that is reflective of needs and resources.

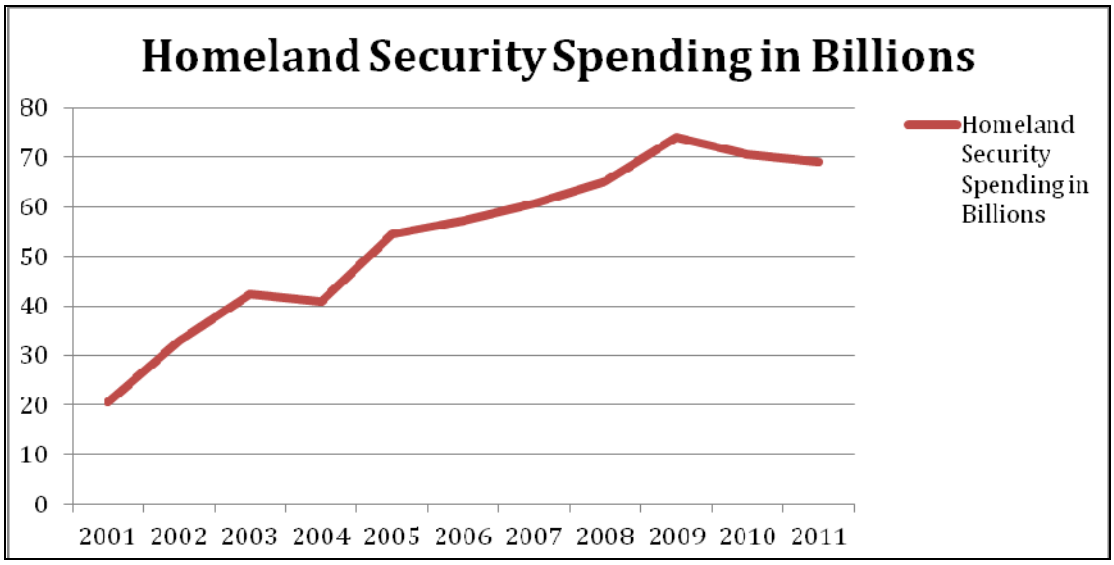

Figure 5.1 Graph of Federal Homeland Security Spending, Fiscal Years 2001–2011 (in billions of $ 2011) (From Federal Emergency Management Agency, 2012)

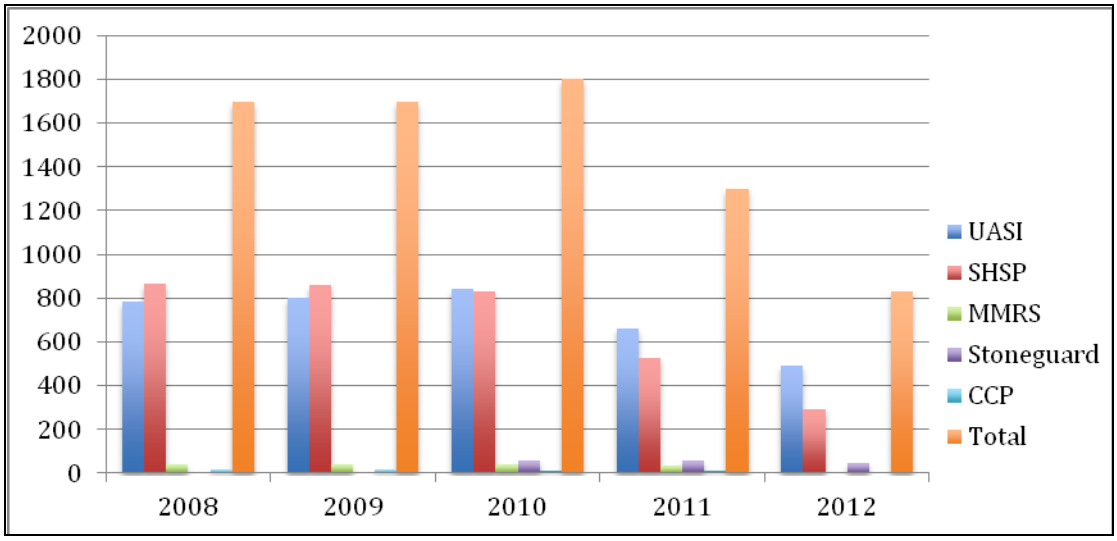

Figure 5.2 Graph of HSGP Grant Program Funding, Fiscal Years 2008–2012 (in Millions $) (From Federal Emergency Management Agency, 2012)

Since the creation of HSGP, the funding of subprograms and eligibility has fluctuated. As shown in Figures 5.1 and 5.2, federal funding for disaster response grants that supplement disaster readiness programs at the local level of government have been significantly reduced in 2011 and 2012, which is not proportionate in the total spending

for homeland security shown in Table 5.1. The reduced funding of disaster readiness programs will affect response capabilities if local emergency response agencies have become reliant on HSGP to support enhanced capabilities needed in this post-9/11 era of disaster preparedness. Alternative financial strategies for disaster response resilience needs to be addressed, if the goal of national preparedness outlined in HSPD 8 is to be realized for state and local government from a disaster readiness perspective.

Table 5.1 Chart of HSGP Grant Program Funding in Millions $ (From Federal Emergency Management Agency, 2012)

	UASI	SHSP	MMRS	Stoneguard	CCP	Total
2008	$781.6m	$863m	$39.5m	$0	$14.5m	$1.7b
2009	$798.6m	$861m	$39.8m	$0	$14.5m	$1.7b
2010	$4842m	$832.5m	$39.36m	$60m	$12.48m	$1.8b
2011	$662.6m	$526.9m	$34.9m	$54.9m	$10m	$1.3b
2012	$490.3m	$294m	$0	$46.6m	$0	$831m

C. PUNCTUATED EQUILIBRIUM THEORY APPLIED TO DISASTER PREPAREDNESS FUNDING

When analyzing federal funding for homeland security since September 11, 2001, the enormity of the aftermath set major policy changes in motion, including the creation of DHS, which was the most significant restructuring of federal agencies since the National Security Act of 1947. When looking at the evolution of policy change and complex social systems during times of crisis, punctuated equilibrium theory helps to

explain the stability and volatility of budgetary policies, which may help to forecast punctuated change in financial strategies from stress caused by significant events.

Punctuated equilibrium theory (PET) studies the development of policy change and implies that most social systems exist in an extended period of stasis, which is later "punctuated" by sudden shifts from stress within its own structure (Baumgartner & Jones 1993). This means that there is a period of equilibrium followed by a punctuated change giving way to a new period of equilibrium. Periods of equilibrium represent times of policy adjusting incrementally. Punctuation is a period in which the norm is disturbed especially during large shifts in society or government (Estrada, 2004, p. 6).

When applying PET to national security budgetary policies that occurred after 9–11, it could be seen that a "punctuation" during this time occurred that caused a 350 percent increase over the current levels of homeland security spending during the following eight years. During these years, a significant amount of money was funneled to local emergency responders through HSGP preparedness grants, most likely because of the attention brought to emergency responders during these occurrences and the perceived need. When examining the homeland security budget, a decrease in allotted funds can be seen occurring over the past two years. HSGP funds have been reduced by over 46 percent from the 2010 budget ($1.8 billion) to the 2012 budget ($831 million). When applying PET to the current economic environment, current events may have caused another punctuation in policy when examining the September 2008 financial meltdowns in the United States with an increasing national debt of over $16 trillion (Swagel, 2009.) Concerns over the economy have caused federal government officials to scrutinize disaster preparedness programs in recent years calling for a more efficient method of doing business, which again shifts the equilibrium that occurred after 9-–1. According to Josh Filler, "The basis for these cuts (HSGP) in the eyes of Congress is simple: A lack of quantifiable metrics that measure the additional capability produced by the grants and the perceived slow drawdown of grant funds by recipients." (Filler, 2012) When applying PET to the current economic environment, one can speculate that more reductions could occur, if the current period of equilibrium continues. As stated earlier, to

sustain the current capacity of disaster preparedness programs at different levels of government alternate sustainment strategies will need to be examined.

D. DISASTER PREPAREDNESS FUNDING FOR THE STATE OF TEXAS

1. Texas Task Force 1

The response to catastrophic events for the state of Texas is accomplished through Texas Task Force 1, which is a part of the TEEX[4]. The Institution's foremost programs include the following: fire services, homeland security, search and rescue, public safety and security, public works, economic development, and safety and health (Texas Engineering Extension Service, 2010).

Funding for TX-TF1 is accomplished through two mechanisms: allocated funds through the Texas Legislative Budget Board and federal funding. Although a significant amount of the budget for disaster response is accomplished through federal funding, the majority is funded by the state of Texas. The following tables (Tables 5.2–5.4) list the amount of funds from each source (state or federal) by each year from the TEEX appropriation request for the state of Texas for fiscal year 2012.

Table 5.2 Summary of Total Request by Strategy

Goal/Objective/Strategy	Base 2009	Base 2010	Total Request 2012	Total Request 2013
Provide TX Task Force 1 Capability	3,784,236	3,784,236	3,784,236	3,784,236
(Texas Engineering Extension Service, 2010)				

[4] TEEX works in conjunction with the Texas Division of Emergency Management, the Texas Department of Public Safety, the Texas Department of Health, and local jurisdictions to prevent protect, respond and recover from natural and man-made disasters. The establishment and drive of TEEX is to provide professional and technical training programs on an extension basis to the people in the state of Texas. TEEX was established as a separate state institution and a member of The Texas A&M University System in 1948 that currently serves more than 210,000 persons each year through nearly 6,000 classes.

Table 5.3 Federal Funds Supporting Schedule

Goal/Objective/Strategy	Exp 2009	Est 2010	Bud 2011	BL 2012	BL 2013
Provide TX Task Force 1 Capability	$709,878	$938,031	$938,000	938,016	938,016
(Texas Engineering Extension Service, 2010)					

Table 5.4 FEDERAL FUNDS SUPPORTING SCHEDULE Homeland Security Funding Schedule - Part B Natural or Man-Made Disasters

Description Federal Funds	Exp 2009	Est 2010	Bud 2011	BL 2012	BL 2013
Urban Search/Rescue Response	$857,628	$1,063,826	$960,727	$960,727	$960,727
(Texas Engineering Extension Service, 2010)					

2. HSGP Distribution for the state of Texas

The grant application process for homeland security for states is not a complicated process, but it has to be followed correctly in order for the state to receive funds. After the federal government has funds budgeted for homeland security grants, an application and guidance kit is published within 45 days after the enactment of the grant budget. The state of Texas then submits the application within 90 days after the date the grant application and guidance kit is published. Within 90 days after receipt of applications, the federal government will announce the grant awards. From here, the state of Texas provides eligibility and distribution packets for the 24 COGS (the executive committee) throughout the state. An email sent by the Deputy Assistant Director of Services for TDEM and the FEMA HSGP program overviews from 2008 to 2012 show the distribution of HSGP funds to eligible jurisdictions in Tables 5.7 through 5.11 for the state of Texas. The COGs then report the local distribution to the state of Texas, so that grants awards can be made to the identified projects identified in local jurisdictions within 45 days of approval from the state (Staples, 2010). To ensure that the state of Texas is eligible to apply and distribute homeland security grants, the following need to be completed in order to be eligible: investment justifications have to be completed, the

state preparedness report has to be submitted, and the state and urban area strategies must be current (Staples, 2010). The three subprograms that have a bearing on fire department disaster response from the HSGP are the UASI, SHSP, and the MMRS.

The UASI program distributes federal funds to improve regional readiness in major metropolitan areas throughout the United States. The UASI program is meant to assist participants in their creation of regional systems for prevention, protection, response, and recovery, thus, increasing regional collaboration and readiness (Federal Emergency Management Agency, 2012). In accordance with federal policies, at least 25 percent of the combined HSGP funds allocated under UASI and SHSP are dedicated towards the LETPA (Law Enforcement Terrorism Prevention Activities) related to one or more core competences within the national preparedness goal. The LETPA allocation can be from SHSP, UASI or both (Federal Emergency Management Agency, 2012).

SHSP supports the implementation of State Homeland Security Strategies to address the identified planning, organization, equipment, training, and exercises needed to prepare, prevent, protect, respond, and recover from natural and man-made disasters. Assisting states by allocating funding through SHSP, it assists the jurisdiction to meet objectives outlined in the states homeland security strategy, which supports the implementation of the National Preparedness Guidelines, the National Incident Management System, and the National Response Framework.

The Metropolitan Medical Response System subprogram is designed to support the multi-agency coordination of a jurisdictions medical system in order to meet the needs that will arise during mass casualty events such as nuclear, biological or chemical terrorist incidents (Maniscalco & Christen, 2011). The goal of the program is to provide needed resources to decrease the potential costs of a mass casualty event during the initial phases of the event. By developing regional collaboration, equipment and supplies procurement, emergency triage and prehospital treatment/emergency medical services, hospital evacuation, patient tracking, etc. is already in place (Federal Emergency Management Agency, 2012). MMRS also include facets of response, such as disaster medical assistance teams and disaster mortuary operational response teams that may be federalized in disaster situations (Maniscalco & Christen, 2011). The program created

124 local MMRS jurisdictions, in which the total budget is distributed evenly (Federal Emergency Management Agency, 2012).

Table 5.5 Grants for the City of Houston Grants for the Cities of Dallas/Fort Worth/Arlington

	UASI	MMRS
2012	$23,936,523	N/A
2011	$41,452,916	$267,608
2010	$39,555,450	$317,419
2009	$39,555,450	$321,221
2008	N/A	$321,221

Table 5.6 Grants for the City of Houston

	UASI	MMRS
2012	$14,292,691	N/A
2011	$25,097,410	$267,608
2010	$19,305,700	$317,419
2009	$19,305,700	$321,221
2008	N/A	$321,221

Table 5.7 Grants for the City of San Antonio

	UASI LEAP	UASI	SHSP LEAP	SHSP	SHSP-UA	MMRS
2011	N/A	N/A	N/A	N/A	$1,198,267	$267,608
2010	N/A	$3,755,361	N/A	$240,414	N/A	$317,419
2009	$1,112,521	$3,184,430	$200,000	$273,805	N/A	$321,221
2008	$1,206,409	$3,366,420	$300,398	$1,467,332	N/A	$321,221
2007	N/A	$4,521,870	N/A	$743,830	N/A	$258,144

Table 5.8 Grants for the City of Austin

	UASI LEAP	UASI	SHSP LEAP	SHSP	SHSP-UA	MMRS
2011	N/A	N/A	N/A	N/A	$563,971	$267,608
2010	N/A	$1,272,065	N/A	$692,438	N/A	$317,419
2009	$766,210	$2,068,712	N/A	$128,750	N/A	$321,221
2008	$443,383	$1,110,464	$396,109	$258,969	N/A	$321,221
2007	N/A	N/A	$72,500	N/A	N/A	$258,145

Table 5.9 Grants for the City of El Paso

	UASI LEAP	UASI	SHSP LEAP	SHSP	SHSP-UA	MMRS
2011	N/A	N/A	N/A	$55,579	$1,036,753	$267,608
2010	N/A	$3,498,039	N/A	$263,444	N/A	$317,419
2009	$1,377,006	$3,702921	$78,521	$170,887	N/A	$321,221
2008	$1,497,113	$3,877,429	$63,941	$263,306	N/A	$321,221
2007	N/A	$5,572,664	N/A	$146,949	N/A	$258,145

E. THE COST OF TRAINING LOCAL DISASTER RESPONSE TEAMS

In order to determine a correct anticipated cost to train technical rescue and hazardous materials personnel, a number of factors will have to be considered that affect the final estimate for this type of training. The factors that will influence training costs are: Course duration (which will affect backfill costs), tuition, transportation, per diem, and accommodations. When considering where to send personnel for these different specialty courses, agencies must ensure that the courses meet the standards and accreditation established by the AHJ, the state of Texas, and applicable federal regulations. The cost of training technical rescue and hazardous materials technicians can fluctuate contingent on class location. Local classes will cost significantly less because of the associated cost of travel, per diem, hotel stay, rental cars, and accruing backfill cost associated with the length of absence.

Backfill is the associated staffing cost to replace a person (their position in the department) while attending a class. Because the firefighter staffing the vacant position is usually assigned to another shift, it will cause the firefighter to exceed the number of hours in a pay period outlined in the collective bargain agreement. The collective bargaining agreement states, *"All employees shall be paid at the rate of time and one half (1 ½) that of their regular rate of pay for all hour worked over their regular scheduled*

working hours." (City of San Antonio, 2011, p. 19) When approximating the overtime rate associated with backfill, the average hourly overtime rate for Firefighter, Engineer, Lieutenant, and Captain is used in order to estimate for budget purposes.

Table 5.10 Estimating the Cost of Backfill

2012 Pay Rates for SAFD			
Rank	**Position #**	**Hourly rate of pay**	**OT rate of pay**
Firefighter	660	22.05	33.07
Engineer	661	30.64	45.96
Lieutenant	662	31.66	47.5
Captain	663	35.73	53.59
Battalion Chief	664	42.06	63.08
Assistant Chief	665	55.31	82.96
Deputy Chief	666	66.57	99.86
			180.12
AVERAGE HOURLY			45.03
AVERAGE COST FOR A BACKFILL SHIFT			1080.72

Personnel assigned to the TRT and HMRT have a work schedule of 24 hours on duty and 48 hours off duty. When team members are away for training purposes, the person will be placed on administrative leave to relieve them of their normal work assignment. While the person is attending the training, he/she will have their work hours converted from shift work to a 40-hour workweek. According to the Fire Operations Financial Supervisor for SAFD, this averages out to a 1:12 ratio, meaning that one day of class will account for 12 hours of a 24-hour shift. Because classes vary in length and travel time, the SAFD Fire Shift Commander of the person attending the class makes the final determination for the length of administrative leave granted.

1. Technical Rescue Certification Training

Table 5.11 Cost for a Structural Collapse Course at TEEX

Course TNG23D	Structural Collapse Technician
Course Duration	10 days-80 hours------5-24 hours shifts
Tuition	$2,600.00
Backfill:	$5,405.00
Airfare (Southwest)	$0.00
Car rental	$0.00
Per Diem ($56.00 per day) 8 days+1 travel	$504.00
Hotel ($120.00) per night 8 days	$960.00
Fuel for Travel	$200.00
Number of Personnel	**1**
Total Cost	**$9,669.00**

Table 5.12 Cost for a Swift Water Rescue Class at TEEX

Course TNG80Z	Swiftwater Rescue Technician Course
Course Duration	3 days-32 hours----1 ½ -24 hours shifts
Tuition	$800.00
Backfill	$1,621.50
Airfare (Southwest)	$0.00
Car rental	$0.00
Per Diem ($56.00 per day) 4 days	$224.00
Hotel ($120.00) per night 5 nights	$0.00
Fuel for Travel	$50.00
Number of Personnel	**1**
Total Cost	**$2,695.50**

Table 5.13 Cost for a Rescue Boat Operator Class at TEEX

Course TNG81O	Rescue Boat Operator
Course Duration	1 day-8 hours---------- ½ -24 hour shift
Tuition	$395.00
Backfill	$540.50
Airfare (Southwest)	$0.00
Car rental	$0.00
Per Diem ($56.00 per day) 1day	$56.00
Hotel ($120.00) per night 5 nights	$0.00
Fuel for Travel	$50.00
Number of Personnel	**1**
Total Cost	**$985.50**

Table 5.14 Cost for a Trench Rescue Course at TEEX

Course TNG26S	Trench Rescue
Course Duration	5 days-40 hours----2 ½ -24 hours shifts
Tuition	$1000.00
Backfill	$2,702.50
Airfare (Southwest)	$0.00
Car rental	$0.00
Per Diem ($56.00 per day) 5 days	$280.00
Hotel ($120.00) per night 5 nights	$600.00
Fuel for Travel	$100.00
Number of Personnel	**1**
Total Cost	**$4,682.50**

Table 5.15 Cost for a Rope Rescue Course at TEEX

Course RES004 & RES007	Rope Rescue
Course Duration	8 days-68 hours ------ 4-24 hour shifts
Tuition	$2,000.00
Backfill	$4,324.00
Airfare (Southwest)	$0.00
Car rental	$0.00
Per Diem ($56.00 per day) 6 days	$336.00
Hotel ($120.00) per night 5 nights	$1,200.00
Fuel for Travel	$200.00
Number of Personnel	**1**
Total Cost	**$8,060.00**

Table 5.16 Cost for a Confined Space Rescue Course at TEEX

Course RES002	Confined Space Rescue Technician
Course Duration	4 days-36 hours------ 2-24hr shifts
Tuition	$860.00
Backfill	$2,162.00
Airfare (Southwest)	$0.00
Car rental	$0.00
Per Diem ($56.00 per day) 4 days	$336.00
Hotel ($120.00) per night 4 nights	$480.00
Fuel for Travel	$100.00
Number of Personnel	**1**
Total Cost	**$3,938.00**

Table 5.17 Cost for a Technical Search Specialist Course at TEEX

Course TNG11S12	Disaster Technical Search Specialist
Course Duration	5 days-40 hours------ 2-24hr shifts
Tuition	$1,500.00
Backfill	$2,702.50
Airfare (Southwest)	$0.00
Car rental	$0.00
Per Diem ($56.00 per day) 6 days	$336.00
Hotel ($120.00) per night 5 nights	$600.00
Fuel for Travel	$100.00
Number of Personnel	**1**
Total Cost	**$5,238.50**

Table 5.18 Cost for a Wilderness Rescue Course at TEEX

Course RES008	Wilderness Rescue
Course Duration	6 days-60 hours------ 3-24hr shifts
Tuition	$2,000.00
Backfill	$3,243.00
Airfare (Southwest)	$0.00
Car rental	$0.00
Per Diem ($56.00 per day) 6 days	$336.00
Hotel ($120.00) per night 6 nights	$1,200.00
Fuel for Travel	$100.00
Number of Personnel	**1**
Total Cost	**$6,399.00**

Table 5.19 Cost for a Vehicle and Machinery Extrication Course at TEEX

	Vehicle and Machinery
Course Duration	4 days-36 hours ------ 2-24 hour shifts
Tuition	$860.00
Backfill	$2,162.00
Airfare (Southwest)	$0.00
Car rental	$0.00
Per Diem ($56.00 per day) 4 days	$336.00
Hotel ($120.00) per night 4 nights	$480.00
Fuel for Travel	$100.00
Number of Personnel	**1**
Total Cost	**$3,938.00**

TOTAL COST TO TRAIN A RESCUE TECHNICIAN $40,682.50

2. Hazardous Materials Certification Training

Table 5.20 Cost for an 80-hour Hazmat Technician Course at TEEX

TEEX	80 hour Hazmat/WMD Technician Course
Course Duration	10 days-80 hours—5-24 hour shifts
Tuition	$2,000.00
Backfill:	$5,405.00
Airfare (Southwest)	$0.00
Car rental	$0.00
Per Diem ($56.00 per day) 12 days	$672.00
Hotel ($120.00) per night 12 days	$1,440.00
Fuel for Travel	$100.00
Number of personnel	**1**
Total Cost	**$9,617.00**

Table 5.21 Cost for a Transportation Specialist Course at TEEX

TEEX - Course HAZ029	NFPA 472 Transportation Specialist Training
Course Duration	5 days-50 hours------ 2.5-24hr shifts
Tuition	$2,000.00
Backfill	$2,702.50
Airfare (Southwest)	$0.00
Car rental	$0.00
Per Diem ($56.00 per day) 6 days	$336.00
Hotel ($120.00) per night 5 nights	$600.00
Fuel For Travel	$100.00
Number of personnel	**1**
Total Cost	**$5,738.50**

Table 5.22 Cost for a Hazmat Incident Command Course at SERTC

SERTC	Incident Command for Hazmat
Course Duration	5-days-40 hours------ 2.5-24hr shifts
Tuition	$1,694.00
Backfill	$2,702.50
Airfare (Southwest)	$353.00
Car rental	$0.00
Per Diem ($46.00 per day) 5 days	$230.00
Hotel ($120.00) per night 5 nights	$600.00
Fuel For Travel	$0.00
Number of personnel	**1**
Total Cost	**$5,579.50**

Table 5.23 Cost for a Hazmat Incident Command Course at SERTC

Nevada Test Site - Course PER-241	WMD Radiological/Nuclear Course for Hazmat Technicians
Course Duration	3 days + 2 day travel 2.5 shifts
Tuition	Sponsored by DHS/FEMA
Backfill	$2,702.50
Airfare (Southwest)	$0.00
Car rental	$0.00
Per Diem ($71.00 per day) 5 days	$355.00
Hotel ($120.00) per night 5 nights	$0.00
Fuel For Travel	$0.00
Number of personnel	**1**
Total Cost	**$3,057.50**

Table 5.24 Cost for a Hazmat Sampling Course at the Center for Domestic Preparedness

Center for Domestic Preparedness - Course - PER 268	Public Safety WMD Response - Sampling Techniques and Guidelines
Course Duration	1 day +2 day travel----1.5 shifts
Tuition	Sponsored by DHS/FEMA
Backfill	$2,162.00
Airfare (Southwest)	$0.00
Car rental	$0.00
Per Diem ($46.00 per day) 4 days	$184.00
Hotel ($120.00) per night 4 nights	$0.00
Fuel For Travel	$0.00
Number of personnel	**1**
Total Cost	**$2,346.00**

Table 5.25 Cost for an Incident Response to Terrorist Bombings at New Mexico Tech

New Mexico Tech - Course Per-230-1	Incident Response to Terrorist Bombings
Course Duration	3 days + 2 day travel 2.5 shifts
Tuition	Sponsored by DHS/FEMA
Backfill	$2,702.50
Airfare (Southwest)	$0.00
Car rental	$0.00
Per Diem ($46.00 per day) 5 days	$230.00
Hotel ($120.00) per night 5 nights	$0.00
Fuel For Travel	$0.00
Number of personnel	**1**
Total Cost	**$2,932.50**

TOTAL COST TO TRAIN A HAZMAT TECHNICIAN $29,299.00

F. SUMMARY

When examining the current trend in HSGP funding over the past decade and the current decline in funding over the past two years, it can be assumed that HSGP may not be a primary method in the future to sustain disaster response capabilities. In the current political (punctuated) environment, government spending towards disaster response may be reduced because the perceived need for emergency response has changed following the events of Sept.11. The following quote was taken from an abstract written by Jena Baker McNeill, who is a Senior Policy Analyst for homeland security for the Heritage Foundation (McNeill, 2011).

> The President's 2012 budget request would maintain homeland security funding at current levels, but the budget request would increase funding for several programs that add little additional security while cutting others that could significantly enhance U.S. homeland security. Congress should use the budget process to refocus the Department of Homeland Security on its primary objective of improving security. Counterproductive homeland security grants to state and local governments should be eliminated or curtailed and redesigned.

Examining the cost and funding trends for fire department and US&R capabilities can glean a better understanding of how disaster response should be funded. In particular, the duplication of effort in regards to disaster response organizations at the different levels of government. By pointing out these redundancies, policy makers will be able to determine if some of these duplications are necessary, or if better coordination between different organizations and levels of government is needed.

VI. POLICY ANALYSIS

The policy analysis chapter examines the status quo for disaster response in the state of Texas (centralized model) and an alternative model using a decentralized approach. The goal of examining these different response models is to evaluate the disaster response framework in the state of Texas and to provide insight to see if the current response framework is optimal, or if there are ways to improve the efficiency and effectiveness. The chapter also explores if local disaster response capabilities are being utilized at the state level of disaster response to provide a more economical method and capable method to maintain disaster response capabilities at the different levels of government.

A. POLICY OPTION A—MAINTAINING THE STATUS QUO

The status quo for disaster response in the state of Texas is a centralized approach. The state of Texas uses a tiered response to mitigate catastrophes that relies on local fire departments to complement TX-TF1 to respond to incidents that devastate local response resources. TX-TF1, which is backed by TEEX in College Station, Texas, consists of a Type I and Type II USAR team. It is made up from over 60 jurisdictions across Texas and has the capability to respond 24 hours a day and deploy within four hours of activation (*Texas Task Force 1: Urban Search and Rescue Response System*, 2012).

Personnel from various fire departments from all over the state are selected to become technical experts in disaster response and mitigation. TX-TF1 members are trained as specialists, and many members are cross-trained in other jobs on the task force. Members are required to complete over 90 hours of training per year, attend regional training and attend an annual full-scale exercise in Disaster City or mobilization exercise (*Texas Task Force 1: Urban Search and Rescue Response System,* 2012).

Activation of TX-TF1 requires the recall of personnel from different fire departments around the state. According to the San Antonio Fire Departments Special

Operations Chief, participating personnel can be put on standby when there is forewarning of a major event. During no notice events, personnel have to drive to College Station to assemble and deploy.

1. Response Flexibility

When examining how versatile the current system of response is to catastrophes, TX-TF1 has been incorporating different concepts that may adapt to the needs of single and multiple events by deploying what they call a Type-3 US&R team. The team consists of 28 members for light structural collapses and general rescue situations (*Texas Task Force 1: Urban Search and Rescue Response System,* 2012). This would allow a more versatile approach to multiple responses than simply deploying the 70-person Type-1 US&R team.

Although TX-TF1 is a dynamic team that can respond and mitigate a multitude of events if fully staffed, it still requires the support of local responders to drive to College Station in order to deploy. If multiple events were occurring in two or three of the major jurisdictions, such as Houston, San Antonio, Austin, Dallas, or Fort Worth, the team would be hindered because of the centralized location for equipment, administrative, and other logistics. Because of this, the response flexibility for the status quo would allow a timely response for more than two major incidents. This gives a ***marginal rating*** for Policy Option A, maintaining the status quo for response flexibility.

2. Regional Collaboration

Using the current response and preparedness model, TX-TF1 has 150 of its members who come from participating fire departments around Texas. According to the SAFD liaison officer for TX-TF-1, regional collaboration occurs during deployments and training that is conducted on an annual basis. This constitutes annual training for skills two days a year, regional training at a host department that happens one day a year, and either a mobilization or full scale exercise that constitutes two days of training once a year. The fiscal sharing for this response model is accomplished by the TX-TF1 providing for the equipment, training, logistics, and administrative needs associated with this type of program, while participating fire departments burden the cost associated with

backfill cost for annual training. Backfill costs for actual deployments are reimbursed to the participating fire departments that have approved their personnel to be deployed.

Regional collaboration under this model is very limited because of the wide range or responders that participate from all over Texas. There is no impetus to train with other agencies or jurisdictions like there is when creating mandatory training requirements such as those on TX-TF1. This is not a conducive approach to facilitate collaboration within a particular region because no response training is ever done with neighboring fire departments. Although this model does not facilitate and encourage collaboration at the regional and local levels of government, it does not hinder this process. At the state level for disaster response, the current model does a good job by having an independent agency like TEEX that coordinates with lead agencies within the state and federal government.

The cost sharing under this model is beneficial for participating fire department because it allows TX-TF1 that is funded by the state and federal governments to shoulder most of the upfront costs associated with this type of operation. It also shares the burden of training costs by waiving school fees for participating members while the local government shoulders the costs of backfill for training.

Because this model lacks the way to facilitate coordination, planning, and response at the local and regional levels of government, a ***marginal rating*** will be given to Policy Option A, maintaining the status quo for regional collaboration.

3. Proficiency of Responder KSAs (Knowledge, Skills, Abilities)

TX-TF1 members are required to complete over 90 hours of training per year, attend regional training and an annual full scale or mobex (mobility exercise) at TEEX. This provides a consistent way to train members with a quality of instruction that surpasses most, since DHS has identified TEEX as an educator for emergency response higher education.

None of the TX-TF1 members are required to be on a fire department special operation team or to do additional training while on duty with their fire department.

Because of this the training and experience for disasters is limited compared to personnel that perform these types of skill requirements as part of their regular job.

Although the quality of instruction is excellent for personnel on TX-TF1, the everyday reinforcement of those skills is not realized under this model. A ***good rating*** will be given to Policy Option A, maintaining the status quo for proficiency of responder KSAs.

4. Timeliness of Response

Policy Option A uses a centralized response by having TX-TF1 personnel drive to College Station in order to collect gear and equipment to deploy to a major emergency. College Station is located in the East Central part of Texas. Areas that have major population densities that are furthest from College Station are El Paso, Brownsville, Laredo, Lubbock, and Amarillo. According to Google Maps, the following are the distances and travel time. El Paso is 668 miles away and takes 11 hours and 36 minutes travel time. Brownsville is 388 mile away and takes 7 hours and 13 minutes travel time. Laredo is 325 miles away and takes 5 hours and 57 minutes travel time. Lubbock is 439 miles way and takes 7 hours and 46 minutes travel time. Amarillo is 513 miles away and takes 8 hours and 53 minutes.

When examining the centralized approach for disaster response, it is obvious that this will be the slowest method because of the travel time to College Station and travel time to the disaster site. Even if the disaster were close to College Station, TX-TF1 would still have to wait until they had enough manpower to respond. Because of these reasons, a ***poor rating*** will be given to Policy Option A, maintaining the status quo for timeliness of response to disasters.

5. Cost Efficiency

Funding for TX-TF1 is funded by the state of Texas Legislative Budget Board and through federal funding. As stated earlier, a significant amount of the budget is accomplished through federal funding, but the majority is funded by the state of Texas. This does not account for HSGP funds that are used to equip, train, and prepare a region

and local jurisdictions for disaster response. When looking at the fire departments participating on TX-TF1, out of the 150 personnel only 29 of these people are on special teams that receive HSGP funds for this type of training. This shows two lines of spending for the same type of response capability; one that funds local governments with HSGP and the funding that TX-TF1 receives from the state and federal government to sustain their response capabilities. Since TX-TF1 is only activated when local, regional, or other state governments are overwhelmed or do not have the response capability to mitigate the effects of a disaster, the value for the cost of this resource is diminished because these capabilities are not used on a regular basis.

Although there seems to be an unnecessary duplication in effort at the local and state levels of government, the response capability for this team is outstanding. TX-TF-1 is the most deployed urban search and rescue team in the country. TX-TF1 responded to at least one major disaster each year since its first deployment in 1998. From the 9/11 World Trade Center attacks to Hurricane Katrina's devastation, TX-TF1's USAR and water rescue teams have expertise in responding to both man-made and natural disasters.

Although the capability of this team is excellent, the duplication in funding for the same type resources reduces the ***rating to a marginal*** for Policy Option A, maintaining the status quo for cost efficiency.

B. POLICY OPTION B—DECENTRALIZED DISASTER RESPONSE MODEL

Policy Option B is a decentralized approach to disaster response at the local, regional, and state level of government. This option recommends using Type II US&R teams, which is a 22-person urban search and rescue team nationally qualified to perform search and rescue operations and is self sustained for the first 24 hours within the identified areas (Council of Government or COG) that are funded by HSGP (*Texas Task Force 1: Urban Search and Rescue Response System*, 2012). For the state of Texas, these teams would be located in Houston, San Antonio, Dallas-Fort Worth-Arlington triplex area, Austin, and El Paso. These teams would provide the foundation and define the make up of personnel assigned to the Type I USAR team funded by FEMA, which is a 70-

person urban search and rescue team nationally qualified to perform search and rescue operations and is self sustained for 24-hour operations for a minimum of 14 days before requiring personnel rotations, which is TX-TF1 (*Texas Task Force 1: Urban Search and Rescue Response System*, 2012). Teams located within these assigned jurisdictions would also have the responsibility for establishing regional training and partnerships. The goal would be to incorporate these smaller agencies into the Type II regional teams to ensure all personnel in the region were on the same page with regards to preparedness plans and proficiency requirements.

This approach is currently utilized by TX-TF1 in the state of Texas during flooding events to activate swift-water strike teams in different areas of the state in which the author of this paper has participated and assisted with training development.

TX-TF1 provides the KSAs and certification criteria that are given to the local fire departments or other agencies in the region to ensure participating personnel are trained to a certain level of proficiency and then put on a roster. Memorandum of understanding (MOUs) are then signed and given to TX-TF1, which are the same MOUs as participating personnel on a Type I or II US&R team. This allows the local agency to manage the swift water team roster and send personnel who have the necessary proficiency to accomplish the mission. Personnel who have either transferred or promoted to another position are taken off the roster and substituted by their replacement on the respective local team when certification criteria has been met. This allows the local agency to select the personnel for deployment who are proficient and able to meet the physical needs of the mission. By allowing local agencies to manage these rosters, personnel for these teams will have more experience and proficiency, since they are currently fulfilling these KSAs as part of their regular duty assignments for their agency.

1. Response Flexibility

Policy Option B opts for a decentralized approach to disaster management by establishing Type II US&R teams in jurisdictions that are currently receiving HSGP funds. Personnel on Type II US&R teams would also be used to compliment the TX-TF1 roster that responds to state and federal disasters. By decentralizing TX-TF-1 personnel,

equipment, and other logistical needs, the state of Texas would have five Type II US&R teams that would be self-sustaining for the first 24 hours of an event. This would allow these teams to manage five different events, if needed. Because of this, the response flexibility for a decentralized response would allow a timely response for more than three major incidents. This would give an ***excellent rating*** for Policy Option B decentralized disaster response model for response flexibility.

2. Regional Collaboration

The concept of utilizing a lead jurisdiction, or agency, to manage the training and resources for a particular region has pros and cons for regional collaboration. The pros are there will be consistency in how the program is managed in the region. How this is accomplished, and how partnerships are built with other agencies within the region, is of fundamental importance for successful collaboration. This will be dependent on the leaders in the region; how well they work together and how much "buy-in" they have for the strategy. By naming a lead organization to manage the Type II US&R team, it may lead to other organizations in the region to feel alienated and withdraw support. Again, strategies would have to be developed in partnership in order for a regional concept to become established in which various organizations in the region had ownership. Because there is no guarantee that Policy Option B would get buy in for a particular region, the rating for the decentralized disaster response model would be ***marginal***. The policy would not hinder or facilitate regional collaboration.

3. Proficiency of Responder KSAs (Knowledge, Skills, Abilities)

As stated earlier, TX-TF-1 participants are required to perform at least 90 hours of training per year to include a regional and mobex. Comparing this to local fire departments that have specialized teams in the hazmat and technical rescue disciplines should provide an accurate assessment. This will be accomplished by using the San Antonio Fire Departments Technical Rescue and Hazardous Material Response teams as a case study for this comparison.

The Technical Rescue Team specializes in Urban Search and Rescue (USAR), high angle rescue, confined spaces rescue, swift water rescue, trench rescue, building collapse, cave rescue, advanced auto and big rig extrication, industrial accidents, as well as wilderness rescue.

The Hazardous Materials Response Teams (HMRT) take the lead in mitigating incidents involving chemical transportation accidents, chemical spills in business/manufacturing facilities, and acts of terrorism involving WMD.

According to the Chief in charge of Special Operations for the San Antonio Fire Department, both TRT and HMRT are regional teams that respond to significant events within the Alamo Area Council of Governments, which is an 11,354-square mile, 12-county area. The versatility and interoperability of these teams has led to successful joint operations with other agencies at all levels of government. Both the TRT and HMRT also complete over 1000 hours of annual training that has led to the establishment of in-house certification programs that exceed local, state, and federal standards (San Antonio Fire Department, 2010).

Because the everyday reinforcement of KSAs are used under this model during normal responses and for the development of in house certification programs, an ***excellent rating*** will be given to Policy Option B, the decentralized disaster response model for proficiency of responder KSAs.

4. Timeliness of Response

Timeliness of response, and how quick a response team can get to the scene of an emergency, whether a local, regional, or state jurisdiction, is largely dependent on where the event happens in relation to where emergency responders are located. Because of this, the fire service has traditionally utilized a decentralized approach to emergency response in large jurisdictions in order to minimized response times. NFPA 1710, Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments states that: *"The fire department's fire suppression resources shall be deployed to provide for the arrival of an engine company within 240- second travel time to 90 percent of the*

incidents." (National Fire Protection Association, 2010, 5.2.4.1.1) By using a decentralized method, more of a geographical area can be covered in the least amount of time.

Although regional and state disaster response teams cannot meet the same response time expectations as career fire departments, the same decentralized concept can be utilized. When surveying the placement of Type II US&R teams, there are three factors to be considered: (1) Does the host jurisdiction have the personnel and ability to sustain this type of team? (2) Will the Type II US&R team be located in a densely populated area of Texas? (3) Will the Type II US&R team be located in areas with major highways access to other regions and areas of the state to facilitate a rapid response.

When examining the population density map Figure 6.3, it shows the five top most populated areas as Houston, Dallas-Fort Worth-Arlington, San Antonio, Austin, and El Paso. The federal government has also identified these areas as high-threat, high-density urban areas eligible for UASI funding. Because these areas have been identified as such and are eligible for UASI funding, the ability to sustain disaster response capabilities dramatically increases because of the cost associated. Currently, all fire departments in these jurisdictions have technical rescue and hazmat capabilities with substantial manpower to expand capabilities. Figure 6.4 also illustrates that these jurisdictions have access to major highways needed for a timely response.

Because the decentralized model provides a method of response to mitigate the effects of a disastrous event in the least amount of time by utilizing a decentralized and tiered method of response, an ***excellent rating*** will be given to Policy Option B, decentralized disaster response model for response timeliness to disasters.

5. Cost Efficiency

When studying how cost efficiency relates to Policy Option B (decentralized model), the financial mechanisms to be used to sustain these programs need to be examined. Policy Option B advocates the establishment of Type II US&R teams in the state of Texas that will then be used to augment TX-TF1, which is a Type I US&R team used for both state and federal assistance. Currently, there are two lines of funding

occurring at the state level of government for disaster response. One line is being used to sustain the response capabilities of TX-TF-1, which is both federally and state funded. The other is the HSGP program, which is designed to assist local responders and prepare for disaster response, which is also funded by the federal government. Both these programs are aimed at the same goals of disaster mitigation and preparedness but run parallel to each other instead of incorporating both programs to maximize efficiency. By allowing the identified local jurisdictions to manage an allocated number of positions determined by TX-TF1, it would allow a more efficient use of funds for training and equipment by utilizing local response personnel who are already performing and certified in US&R KSAs.

Another positive point would be the establishment of in-house training programs in order to train the Type II US&R team. This would be done in coordination with TX-TF1 to ensure established standards are being met and a standardized processed is used.

The drawback of Policy Option B would be the start-up expense for initial training and equipment needed for Type II US&R teams. Although these jurisdictions are identified for federal grant assistance, there is no assurance that money would be allocated on a regular basis to support the programs. Also, some of these identified response organizations have capabilities that meet or exceed TX-TF1, but some may not be at the same level, which may lead to a diminished level of capability at the onset of the program.

Policy Option B incorporates both funding mechanisms and maximizes dollar on return by utilizing disaster response capabilities at the local level of government that is more efficient than the status quo. Because the initial start-up cost would be substantial, and there is no assurance that federal grant dollars would provide support for these programs, a **good rating** will be given to Policy Option B, decentralized disaster response model for cost efficiency.

Table 6.1 Disaster Response Criteria Matrix

Policy	Response flexibility	Regional collaboration	Proficiency of responder KSAs	Response timeliness to disasters	Cost Efficiency
A Status Quo	Marginal	Marginal	Good	Poor	Marginal
B Decentralized	Excellent	Marginal	Excellent	Excellent	Good

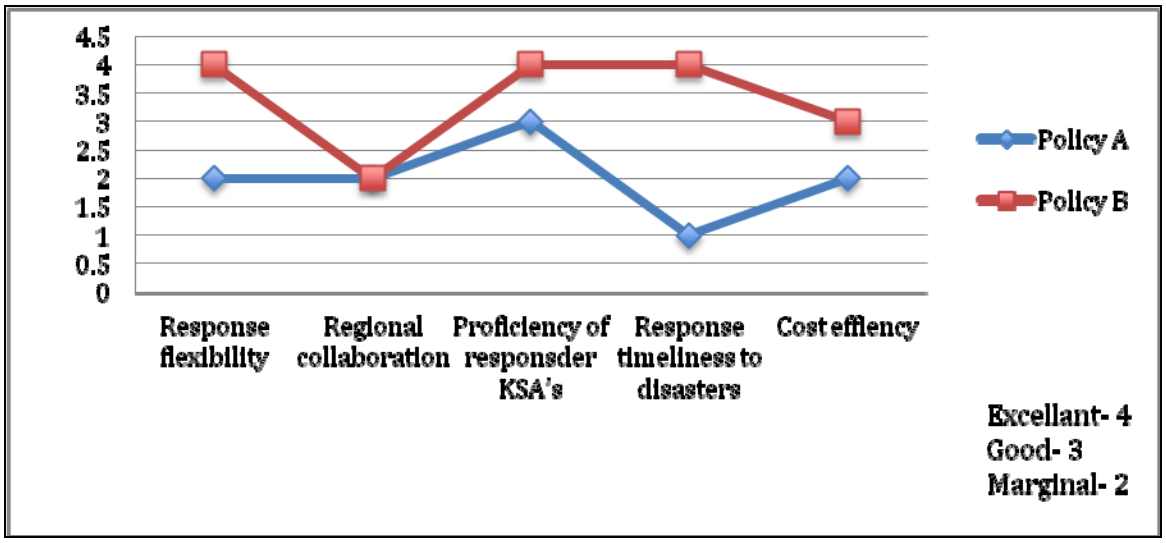

Figure 6.1 Disaster Response Policy Criteria Comparison Chart

C. FINDINGS OF THE POLICY ANALYSIS

When examining the expectations from the directives and policies handed down by the federal, state and local levels of government, the collaboration and partnership between organizations and the different levels of government is a fundamental cornerstone to success. This has been demonstrated by lessons learned in recent history

during the events of 9/11 and Hurricane Katrina. Collaboration is no longer optional but is prerequisite for disaster planning and response. Emergency responders are expected to respond seamlessly with other organizations to provide the most effective and efficient solution to mitigate the problem. The approach is also expected in planning and resource sharing at the different levels of government in order to reduce cost and increase capability.

The fire service in particular has had to look at its response capabilities to meet the demands of a changing environment that includes acts of terrorism and natural disasters. Technical rescue and hazardous material response teams have become a norm in jurisdictions with large populations. The fire service has used the capabilities of these teams to meet the increased demands of the current environment. How these new capabilities are funded and sustained is an area of concern for many local jurisdictions because of the expense associated with these capabilities.

Many jurisdictions have relied on HSGP funds because the local government cannot afford to sustain these advanced skills with expensive resources to mitigate "black swan events." In recent years, many jurisdictions have been eliminated or have had significant reduction in federal grant dollars that are a primary method to fund these capabilities. The current economic environment may have instigated a shift in priorities for the federal government and the general public, which have caused federal government officials to scrutinize disaster preparedness programs and calling for a more efficient method of doing business.

When examining the disaster response framework in Texas, TX-TF1, which is the responsible organization for disaster response, may want to examine the current method of augmentation of its response force. By utilizing personnel that are on local special operation teams, it would: (1) increase the proficiency of responders by utilizing personnel that are current in KSAs that are used for their current job, (2) it would streamline training and equipment cost by eliminating the redundancy of training and equipping two groups of responders. By redirecting resources to support a decentralized response system, it also allows for a more flexible and rapid response when responding to disasters.

When analyzing Policy Option A, maintaining this program would be difficult given the current cuts and reorganization of grant assistance from the federal government. The past two years have seen a substantial decrease in funding for many UASI jurisdictions across the nation for disaster preparation and response. Although this option provides local governments flexibility in determining priorities for funding, it is the most expensive model and does not identify a way to consolidate the resources that are within a COG or the state of Texas.

Policy Option B provides a decentralized approach to disaster response at the state level, which streamlines and folds the local response effort into the state response that provides a more efficient and proficient approach to disaster mitigation. As stated earlier, this approach is currently utilized by TX-TF-1 to activate boat teams within a swift-water strike force during flooding events in different areas of the state. This program has been shown to be a more cost efficient method by utilizing the expertise of local responders who are trained to specific criteria established by TX-TF1. When looking at Figures 6.1 and 6.2 comparing the two policies with logical criteria, it clearly show that Policy Option B provides more advantages to statewide disaster response than Policy Option A.

Figure 6.2 Texas Major Road Map (From Coutsoukis, 2010)

VII. SUPPOSITION

As time moves forward and away from the events of 9/11, and more focus is brought to other areas of homeland security and the economy, the time to develop alternate means to sustain disaster response capabilities is now—while there is still grant money available to fund these strategic initiatives. This can be accomplished by implementing three strategies that are addressed in the decentralized response policy (Policy Option B): (1) Utilize personnel, who are currently assigned to local disaster response teams (TRT & HMRT) to supplement TX-TF1 for state and federal response capability: (2) Change the "grant dependent" emergency preparedness culture into one of self-reliance by establishing local training programs for sustainment of capabilities: (3) Prioritize HSGP funds to support local disaster response capabilities that support a regional, state, and federal initiative.

A. UTILIZE LOCAL DISASTER RESPONSE TEAMS TO SUPPLEMENT TX-TF1

According to an email from TX-TF1, 150 fire service participants from 31 different contributing fire departments[5] around Texas are members of their US&R team. From the 150 participants, currently 89 are from jurisdictions that are eligible to receive UASI funds. Out of the identified 89 participants from UASI jurisdictions, 46 are currently assigned to a local fire departments TRT or HMRT. This information was gleaned through email and phone conversations with representatives of Arlington, Dallas, Fort Worth, Houston, San Antonio, Austin, and El Paso fire departments.

One way to increase efficiency at the different levels of government is to eliminate unnecessary redundancy for emergency response preparedness. This can be accomplished by identifying and utilizing responders who are assigned to a local fire departments special operation teams who are already trained to meet the specific needs of disaster response (TRT and HMRT) as participants for TX-TF1. By accomplishing this, duplication in training costs can be eliminated. Another positive attribute of

[5] Email from Stacey Macik regarding TX-TF1 information. August 15, 2012.

implementing this strategy is the increased proficiency and capabilities of responders who will be assigned to TX-TF1. Utilizing personnel, who frequently use disaster response KSAs as part of their regular job, increases the level of competence and experience for TX-TF1.

1. Create Local Training Programs to Sustain Disaster Response Capabilities

Regional training programs for disaster response should be developed to reduce the cost of sending all emergency response personnel for initial and recurring disaster response training. By allowing emergency responders to teach personnel in their organization and others in the region (while on duty), it reduces the cost of training dramatically. This can be accomplished by sending a portion of personnel to train the trainer courses to become instructors.

Using the San Antonio Fire Department as an example, our organization currently has two technical rescue teams for a total of 60 assigned personnel, as well as two hazardous material response teams with a total of 54 assigned personnel. When utilizing the estimated training cost per person, the cost to send all assigned personnel out to training would be $1,580,634.00 for HMRT, $2,440,950.00 for TRT, totaling $4,021,584.00 to train both teams.

An alternative method that would reduce training costs would be a train the trainer program that sent four personnel per shift (two per station totaling 12 trainers for each discipline on each team for needed redundancy), which would reduce the total training cost for both teams to $839,442.00, reducing the expense by $3,182,142.00. This not only reduces the cost of training by over 79 percent but also improves coordination and collaboration with other local and regional emergency response agencies.

By establishing agreements with surrounding fire departments and other emergency response organizations to participate in regional training, standard operating procedures can be practiced and reinforced through interagency and regional training initiatives.

Table 7.1 Train the Trainer Estimate

TRT and HMRT Training Costs	
Total cost to train all SAFD TRT	$2,440,950.00
Total cost to train all SAFD HMRT	$1,580,634.00
Total to train both teams by outsourcing training	**$4,021,584.00**
Total to train both teams by outsourcing training	**$839,442.00**
Savings **79.13%**	**$3,182,142.00**

A good example of a regional approach to disaster response was the emergency response to the attack on the Pentagon on 9/11. The following is a quote from the 9/11-Commission Report.

> While no emergency response is flawless, the response to the 9/11 terrorist attack on the Pentagon was mainly a success for three reasons: first, the strong professional relationships and trust established among emergency responders; second, the adoption of the Incident Command System; and third, the pursuit of a regional approach to response. (Kean, 2004, p. 314)

Even though the response to the Pentagon required multi-agency coordination with a combination of local, state, and federal jurisdictions, it went well because of the collaboration and relationships that had been formed before the event by creating an emergency response management structure that was formalized (Kean, 2004, p. 314). By implementing these types of regional training programs in Texas, we will be doing much of the same through the collaborative initiative and the common goal of training and preparing together as a region.

2. Prioritize HSGP Funding

Prioritizing HSGP funding is needed to ensure that funds are used to prepare state and local governments to prevent, protect, respond, and recover from natural and man-made events. The appropriation of these funds allows local, regional, and state levels of government to prepare for these types of events. The federal government and the state of Texas have identified areas that are at most risk with substantial consequence in high-

density urban areas. These areas in Texas are: Houston, Dallas/Fort Worth/Arlington, San Antonio, Austin, and El Paso (shown in Figure 6.3).

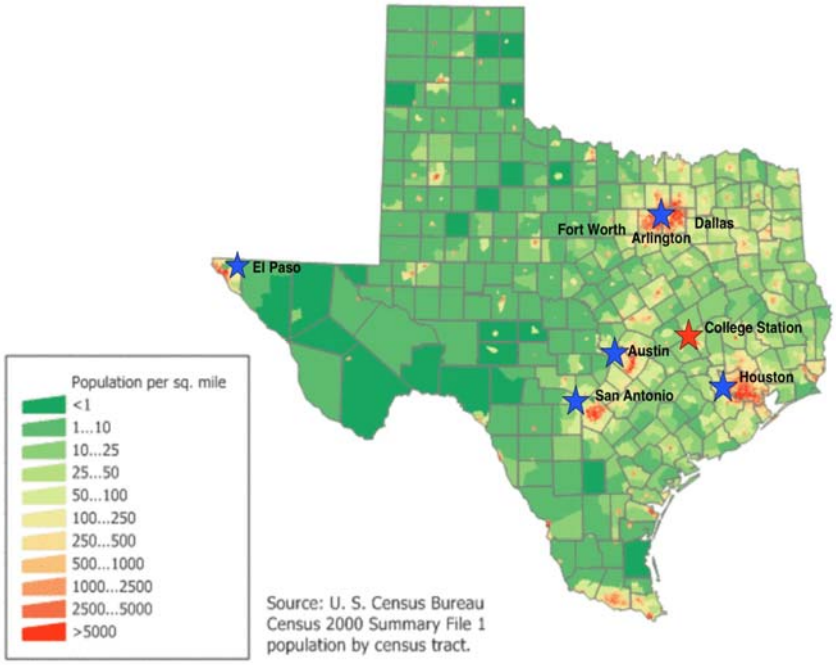

Figure 6.3 Texas Population Density Map

These identified jurisdictions in the state of Texas are where most HSGP funding has been allotted. Because these jurisdictions have been given federal grant dollars in order to prepare for acts of terrorism and natural disasters, they have a responsibility to not only prepare to respond for these types of events in their own jurisdiction but also at the regional and state levels of government. By fulfilling this obligation, these identified jurisdictions should be taking a lead role in disaster response with TX-TF1. By accomplishing this, redundancy in disaster preparedness programs can be eliminated, while increasing the capability of local first responders during everyday emergencies and at the state level during large incidents.

B. STRATEGIC PLANNING POLICY RECOMMENDATIONS

When studying the different aspects and elements associated with disaster response in a state with large geographical boundaries like Texas, a centralized response model does not provide the flexibility and timely response needed during events of a catastrophic nature. This does not mean that disaster response should not have a central hub in which to organize and manage the different emergency response capabilities throughout the state. Quite the opposite, if a successful coordination of preparedness and response is to ensue, then a particular organization(s) needs to take the lead.

In order to implement a strategic plan that will successfully shift from a centralized to decentralize system of disaster response, multiple aspects must be considered to address complications that may hinder shifting from the status quo.

- *How will the change in organization affect organizations that are currently responsible for statewide disaster response?*
- *Who may oppose the change in response philosophy?*
- *How will opposition be overcome?*
- *How will sustainment of the program be accomplished?*
- *How is organizational awareness of this strategy implemented and successfully communicated to emergency response organizations within the state?*
- *How can credibility of a decentralized response system be established?*
- *How is an emergent strategy that adjusts to change and promotes a flexible approach to implementation be established?*
- *What would the strategic plan look like?*
- *What impact will changing from a centralized disaster response model to a decentralized have on statewide disaster response?*

How will the change in organization affect organizations that are currently responsible for statewide disaster response?

To shift from a centralized method of disaster management to a decentralized, two organizations need to take the lead in this initiative—TEEX and TDEM. Currently, both organizations have worked hand-in-hand to provide the needed capabilities for disaster response in the state of Texas. This part should stay as it is, except that TEEX would take a more expansive role to oversee the management of these Type II teams. TEEX is responsible for the management of TX-TF1, while TDEM is responsible for emergency management activities in the state of Texas to include distribution of grant funding. If a decentralized method of statewide capabilities is commenced, TEEX should be the lead agency for managing these organizations under the supervision of TDEM.

Some response agencies currently supporting TX-TF1 by allowing their personnel to participate as responders, may not be included in the decentralized method in order to reduce redundancies in training, equipment, and money spent that is already being accomplished through HSGP funds at the local level for identified jurisdictions.

Who may oppose the change in response philosophy?

Opposition would come from any organization that may lose out on grant funding, fire departments cut out from participating on TX-TF1, and leaders of organizations that may resent having another organization oversee and evaluate the effectiveness or their disaster response capabilities.

Many emergency response organizations in smaller jurisdictions may not have an adequate tax base to support training and equipment needed to mitigate the effects of a disaster. These agencies rely on grant programs or by the training provided by TX-TF1 (for personnel selected to participate in the USAR program) to supplement disaster response capabilities.

How will opposition be overcome?

Opposition will be overcome by having TDEM implement policy that streamlines funding from federal grants to the organizations that will be tasked with the statewide responsibility. Although some grant funding is allocated to the specific counsels of

government to distribute within the jurisdiction, TDEM can assign a specified percentage to establish and maintain capabilities for the identified response agencies tasked with statewide disaster response.

Because the decentralized plan is dependent on the identified jurisdictions for support, a major objective would be to obtain their cooperation. Although some emergency response organizations may baulka at having a third party or any other organization provide oversight, most would not risk losing grant dollars administered by TDEM, if this was a requirement to receive HSGP funds. TEEX would have to conduct an evaluation of the capabilities and available emergency response assets for the identified organizations to see what training and equipment needs to be bought and accomplished.

How will sustainment of the program be accomplished?

The support part of this process is how to sustain funding for this endeavor. Subsidy for TX-TF1 is not augmented by any HSGP funds, as are the local levels of government. In order to facilitate the training and equipment needed for these Type II teams around the state of Texas, a portion of HSGP funds should be earmarked and evenly distributed to these teams around the state, much like the mandated 25 percent UASI and SHSP funds that have to be used for law enforcement. This funding would flow through TEEX to ensure the expenditures of grant funds match the needed capabilities for these teams at the local level of government. This provides a third party entity to oversee the finance, which sole responsibility is statewide disaster response without jurisdictional or agency bias.

Another sustainment mechanism of this strategy is to have TEEX assist with developing a standardized training program at the local level of government to implement a plan to create in-house training to accomplish the regional approach to disaster response for the area. TEEX could accomplish this by developing a “train the trainer program,” where selected individuals would take the needed courses at TEEX to become an instructor in a particular discipline. This would not preclude the ability for other personnel to take courses at TEEX but provides the needed training at the local level to

sustain the needed KSAs of these disaster response teams. By undertaking these classes, particular disciplines can be taught in a region by bringing emergency response partners together to do initial and continuing training. This would allow fire service personnel, who need to train in these specialized KSAs, to do so on duty, thus reducing the cost of backfill, travel, and per diem.

Once a training program is accomplished, TEEX, in coordination with an established liaison from each jurisdictional team, would need to create a common matrix that would establish goals and minimum standards to mark success or failure. Establishing in-house quarterly training exercises that would be rated by the TEEX liaison—and then followed by an annual full-scale exercise that is rated by a TEEX evaluator—could do this. Teams that did not meet standards would initially be given a warning and then followed by denying additional grant assistance for that particular team until standards are met.

How is organizational support for this strategy successfully accomplished with emergency response organizations within the state?

To successfully champion this strategy, support must be gained by the participating agencies. Front line personnel for these agencies who support this concept will be putting their reputations for good judgment for their respective organization at risk. Because of this, input from these front line personnel of how this newly adopted strategy is initiated is critical because managers at TX-TF-1 and TDEM may not necessarily have the appropriate knowledge or information to evaluate technical and functional aspects of this strategic initiative. By gleaning input from the personnel in the field who will be responding to these types of disasters, a credible feedback loop can be created to improve or adjust to the current environment.

How can credibility of a decentralized response system be established?

The decentralized approach is currently utilized by TX-TF1 in the state of Texas during flooding events to activate swift-water strike teams in different areas of the state in which the author of this paper has participated and assisted with training development.

To ensure a standard and proficient level of capabilities, TX-TF1 would provide the KSAs and certification criteria to the participating fire departments or other agencies in the region to ensure participating personnel are trained and then put on a roster. Memorandum of understanding (MOUs) are then signed and given to TX-TF1, which are the same MOUs as participating personnel on the current Type I US&R team. This allows the local agency to manage the team roster and send personnel who have the necessary proficiency to accomplish the mission. Personnel who have either transferred or promoted to another position are taken off the roster and substituted by their replacement on the respective local team when certification criteria has been met. This allows the local agency to select the personnel for deployment who are proficient and able to meet the physical needs of the mission. By allowing local agencies to manage these rosters, personnel for these teams will have more experience and proficiency, since they are currently fulfilling these KSAs as part of their regular duty assignments for their agency. By having this "bottom up" management of personnel on the teams, the local sponsoring agency owns the process that gives credibility.

How is an emergent strategy that adjusts to change and promotes a flexible approach to implementation established?

An emergent strategy for a decentralized response model for the state of Texas should be designed to meet a set of aims and purposes that also include current abilities for both statewide and the national level of response. The emergent plan would include the mission statement for both TX-TF1 (Type I US&R team) and the other Type II US&R teams. The mission statement, viewpoint, and goals for this model should be developed and set forth by an advisory panel consisting of the program manager for TX-TF1, the Chief of TDEM, representatives from sponsoring agencies, and task force managers who are currently assigned to TX-TF1. This advisory board for the state's disaster response system would provide strategic planning recommendations by meeting formally every quarter, or when matters may need to be attended. The advisory panel would provide the professional recommendations and technical assistance concerning policy, financial, and procedural issues that would affect any of the teams.

What would objectives for the strategic plan look like?

Objective 1. Maintain National and Statewide Search and Rescue Capability.

- The critical objective of TX-TF1 is to deploy and provide the capability of Urban Search and Rescue response on a national level when activated by FEMA, as well as a statewide deployment capability utilizing a decentralized response model. Continuing to operationally maintain, organize, equip and train all TX-TF1 members in accordance with the FEMA Urban Search and Rescue Response System guidelines will do this.

Objective 2. Provide proactive recruitment and training for Type I and II US&R teams.

- The recruitment and training of new task force members to an operational ready state of deployment will be done at the local level of government for the Type II US&R teams. The Type II teams will then augment the capabilities for the Type I US&R team for national responses or major events within the state.

- Management and coordination for operational deployment of Type I and II US&R teams will be done through TDEM and TEEX. All current US&R members will meet deployment requirements through continued training as set forth by FEMA and the Task Force Advisory Board requirements.

- Management and coordination of all training and administrative records will be coordinated with the Type II US&R task force leader and TEEX.

Objective 3. Establish an action plan to meet proficiency requirements.

- In order to meet deployment and training requirements set forth by FEMA and TX US&R advisory panel, all teams must conduct an annual graded self-assessment. The assessment will consist of an annual large-scale readiness and mobility exercise. The information gleaned from this event will garner a perspective to provide recommendations for improvements to task force leaders and advisory panel members.

- Develop regional training programs to conduct training for all Texas US&R members to meet minimum training requirements set forth by FEMA and the task force advisory panel.

Objective 4. Manage and maintain equipment cache for Type 1 and 2 US&R teams.

- In order to manage the equipment cache in a decentralized model, participating agencies must identify a responsible party for the management of equipment (Logistics Chief) for the Type II US&R teams. TX-TF1 will continue to maintain the equipment cache at the state level of government through TEEX.

- In order to research new technologies and make recommendations for future equipment cache purchases, an equipment committee will be established. The committee will consist of one member from each Type II US&R team and two personnel from TEEX of which one will be the chairperson.

- Identified trainers on the Type II US&R teams will provide training to their members on the proper use, maintenance, storage and deployment of cache equipment.

- The logistics Chief will ensure that US&R personnel maintain an accurate equipment inventory and establish calibration and maintenance scheduling. This will include the rotation of equipment from storage to front line or training.

Objective 5. Successfully deploy and demobilize TX-TF1.

- A key objective is the successfully deployment of TX-TF1 members in accordance with the FEMA Urban Search and Rescue Response System requirements. Accurately tracking and documenting all aspects of deployment and task completion while maintaining safety in all aspects of activation, deployment and demobilization will do this.

- The successful demobilization of TX-TF1 members will include returning the equipment cache to a state of readiness and conducting an after action review (AAR) following each deployment and implement necessary improvements.

Objective 6. Research new technology and practices.

- Research technical and scientific changes and their incorporation into Urban Search and Rescue equipment that may be relevant to enhance TX-TF1's safety and efficiency.

- Research organization and management changes and their incorporation into the Urban Search and Rescue management structure that may be relevant to enhance TX-TF1's safety, efficiency and organizational structure.

- Enhance the system of equipment acquisition, tracking and maintenance.

- Enhance the organizational structure to promote unified themes throughout advisory panel, program manager, task force leaders, work groups and operational personnel.

- Manage and coordinate task force meeting to ensure organization and defined roles on all levels from leadership to operational levels and update annually.

Objective 7. Provide regional training facilities for Type II US&R teams.

- Provide the necessary props for disaster response at current Fire Training Academies or identified training areas for each Type II US&R team.

- Annually assess the TX-TF1 training facility and infrastructure annually.

- Annually review the task force skills not currently supported by the training facilities.

- Based upon annual evaluations of capabilities, determine proposed infrastructure additions for required training and skills.

- In order to continue to provide the best training to the members of the respective specialties involved in the different aspects of Urban Search and Rescue, provide additional training props at each location. The additions of these key equipment props are essential to provide new and current technicians with the most realistic training possible.

What impact will changing from a centralized disaster response model to a decentralized have on statewide disaster response?

The shifting from a centralized framework to a decentralized one answers the question of: How can local and statewide homeland security disaster response objectives be sustained with reduced funding from a fire service perspective? By implementing this policy, it streamlines funds and capabilities to reduce unnecessary redundancies and provides a tangible matrix to show the success of how grant funds were used. It further provides a mechanism to train responders in house, if these funds are ever eliminated in the future. This provides a more resilient model for disaster preparedness and response for the state of Texas.

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