Running head: DEVELOPING A PRE-EVENT TORNADO INCIDENT ACTION PLAN

Developing a Pre-Event Tornado Incident Action Plan for the Metro West Fire Protection District

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CERTIFICATION STATEMENT

I hereby certify that this paper constitutes my own product, that where the language of others is set forth, quotation marks so indicate, and that appropriate credit is given where I have used the language, ideas, expressions, or writings of another.

Signed: _____

Abstract

The problem was that the Metro West Fire Protection District did not have a sample, pre-event tornado incident action plan. The study purpose was to develop a sample, pre-event tornado incident action plan. Action research was used to answer the following research questions: What information is needed to produce a pre-event tornado incident action plan? What are the challenges in developing a pre-event tornado incident action plan? What are the challenges in implementing a pre-event tornado incident action plan? A literature review, survey, and interviews showed that the information needed for a pre-event plan included location of shelters, a communications plan, mutual aid capabilities, and incident objectives. The challenges to developing a plan were the uncertain impact location, lack of training on the plan, the involvement of other agencies and disciplines, time, and funding. Challenges to implementing a plan were noted to be delays in logistics, communications, and training on the plan. The plan produced from the study included initial objectives, field assignments, communication plans, and detailed command and management tasks. Recommendations resulting from this study included adoption of the plan, development of a training program for the plan for emergency management personnel and first responders, identification of continued funding, expansion of the planning processes to address all known or suspected hazards, and research of an applicable preliminary damage assessment process for future plan revisions.

Table of Contents

Tables

Figures

Appendixes

Developing a Pre-Event Tornado Incident Action Plan for the Metro West Fire Protection District

Introduction

The functions of emergency management and emergency response share a symbiotic relationship. Each is interdependent of the other to be successful in meeting the needs of the community during a disaster situation. When the expertise of each system is leveraged, the information, intelligence, and resources necessary to mitigate the effects of a disaster are more efficiently acquired and utilized. The Metro West Fire District provides both emergency management and response to all hazards. The emergency management functions exist within a system that is duplicated by both the cities we serve and also the county we occupy. The processes within the fire district are generalized, being rooted in response planning, and do not specifically address the specialized needs of emergency management.

Recent enhancements of emergency management capabilities in both facilities and technology have produced an end product that is dependent on an emergency response model that has not experienced a commensurate level of refinement. A severe weather event affecting the jurisdiction, a direct tornado touchdown on December 31, 2010, has exposed the need for a system of actions during the emergency response phase that both support the needs of emergency management and ensure safety and success.

The problem is that the Metro West Fire Protection District does not have a sample, pre-event tornado incident action plan. The use of this type of pre-event plan will likely improve the overall performance of emergency response and emergency management in tornado weather events. The magnitude of this problem is accentuated when the frequency of severe weather events that produce and mimic tornado activity and damages affecting the Metro West Fire

District is analyzed. The purpose of this research study is to develop a sample, pre-event tornado incident action plan. An action research methodology will be used to answer the following research questions: What information is needed to produce a pre-event tornado incident action plan? What are the challenges in developing a pre-event tornado incident action plan? What are the challenges in implementing a pre-event tornado incident action plan?

Background and Significance

The Metro West Fire Protection District is located in the growth corridor of west St. Louis County, Missouri. The fire district is a political subdivision of the State of Missouri and provides fire protection, advanced life support emergency medical services with transport, fire prevention and education, plans review, emergency management, and business continuity and disaster planning to approximately 130,000 residents in the cities of Ballwin, Ellisville, Wildwood, Clarkson Valley, portions of Chesterfield, Winchester, and unincorporated St. Louis County. These services are provided from five stations strategically located throughout the 57.5 square mile jurisdictional boundary. The fire district staff is composed of 96 employees, 89 of which are sworn and is governed by a three member, publically elected Board of Directors. The fire district has been providing service to west St. Louis County since 1934.

The traditional functions of emergency management within St. Louis County, Missouri are governed by the St. Louis County Charter and managed through the St. Louis County Police Department's Office of Emergency Management (OEM), which has authority in areas where there are no political subdivision boundaries, or where a city has chosen to adopt St. Louis County as the administrator of emergency management (M. Smiley, personal communication, September 16, 2011). There are 89 cities, towns, and villages within St. Louis County, Missouri. Each of these jurisdictions is responsible for providing an emergency management function for

its citizens. In many instances, law enforcement is assigned the tasks associated with emergency management. Within the Metro West Fire District, emergency management functions for the aforementioned cities within our jurisdiction are administered by 4 police agencies: Ballwin, Ellisville, Chesterfield, and St. Louis County. This method of management has been consistent throughout the author's career in this area.

The Metro West Fire District has always been proactive in planning and analyzing for response. The first instance of focused planning and forecasting for needs, particularly resources, in a disaster situation was in 1989 when Professor Iben Browning predicted that the New Madrid seismic fault, located in southern Missouri, would become active and produce earthquakes that would severely affect the St. Louis metropolitan region. This was the impetus for the process that produced our first Emergency Action Directory, a binder that identified equipment and operators that could be utilized for structural collapse, debris removal, and utility services.

The planning functions within the fire district have always been active for known, non-emergency events. Annual festivals and large event gatherings were administered through a published timeline of events, needed equipment, personnel assignments, and routes for entry and exit. This was the precursor to what today is known as an incident action plan, although not to the level of detail seen for an emergent or expanding incident.

In 2006, the Board of Directors began an initiative to enhance and expand the capabilities of planning and preparedness and emergency management delivery by the fire district. The initial requests were directed towards the status of the district's disaster plan. After several communication sessions with the Chairman of the Board, the information sought related to the plan for apparatus movement within the jurisdiction during times of disaster. This information was the nexus that began the process of continuity planning. The product that was produced

addresses post-disaster activities and business continuity through a best practices model. Further, an opportunity for overhauling and expanding how Metro West provided emergency management through its response activities was identified.

The first actions, in 2009, were a reorganization of roles and responsibilities within the organization. A new division was created, Special Operations, which was responsible for the administration and operations of all emergency management functions. A Director of Emergency Management was named to be a liaison with other agencies in the area and also OEM. These organizational changes influenced the direction of how the fire district would deliver services in a disaster by identifying areas of strength and opportunities for improvement in the areas of technology, infrastructure, and training.

Technology upgrades that allowed a dedicated portable computer access system to a web-based incident management system were obtained. In addition to the flexibility of anywhere access to the management program, the ability to develop and publish complete electronic incident action plans that were linked by Incident Command System (ICS) position assignment increased both the efficiency of planning and the dissemination of information. The initial utilization of this technology was limited to the Special Operations staff for event planning. This process would allow familiarization with functions and capabilities of the program during a transitional period where dual planning functions and forms were in effect. The program's capabilities were of benefit to the overall planning aspects, but were not well received by the field responders.

In addition to these technology components, work was simultaneously progressing on the development of a facility to house the emergency management function. After several iterations of the initial vision, a dedicated emergency operations center (EOC) was constructed

underground within the newest fire station. The aforementioned technology plus the addition of a communications center complete with radio dispatch, computer aided dispatch (CAD) and satellite capabilities, multimedia information portals and projection options, and ICS section areas, completed the process.

Concurrently, training on the aspects of emergency management and expanding incidents was being developed for employees who expressed interest in the program. The training program that fit the needs of the Metro West initiative was obtained through attendance of the Enhanced Unified Incident Management Course through the Texas Engineering Extension service of Texas A&M University. The course allowed the attendees to experience expanding incidents through all ICS functions and integration with a higher authority emergency operations center. While the emergency management functions of the fire district were being upgraded through reorganization, technology, infrastructure, and training, there existed opportunities for similar modifications in the relationship within the response model.

The instances of severe weather and the frequency of these events throughout the Midwest, tornadoes and severe thunderstorms in particular, are well documented and make this region one of the most dangerous for these types of storms (National Oceanic and Atmospheric Administration [NOAA], 2011). Because of the observed increases of severe weather throughout all seasons in 2010, the Board of Directors expressed interest in advancing and increasing the instances of emergency management activations. This decision was the impetus that began the formation of the current emergency management processes associated with severe weather. These processes leverage the adaptability and mobility of the web-based management software and communications. The current system notifies the Director and Coordinator of Emergency Management when a severe weather alert has been issued for the St. Louis region. At that point,

the Director will analyze the current meteorological conditions and projected tracks; call volume and resource status is confirmed to determine capabilities and if the jurisdiction will be adversely impacted. This analysis determines the next level of action; monitor the situation or activation of the EOC. If activation is required, the aforementioned personnel report to the EOC and begin the processes of developing an incident action plan (IAP). In many instances, the rapidity of a storm may preclude the IAP process as the event is completed, with either no damage or minimal impact on the jurisdiction. For the most recent storm season, only 2 of the EOC activations resulted in the distribution of a full IAP (M. Thiemann, personal communication, October 3, 2011). One of these was the result of a tornado.

The direct tornado impact within the Metro West Fire District on December 31, 2010 exposed areas for modifications in response activity. Because of the very brief window of alert and speed of the storm, there was little time for the development of initial incident objectives beyond the required safety of responders (United States Fire Administration [USFA], 2011b). As calls for service within the area of impact began to rise, an influx of equipment was dispatched per normal prioritization. This resulted in multiple apparatus operating within the area with autonomous, loosely organized, or no clear set of operational objectives relative to severe weather needs, both from an emergency response and emergency management aspect. As the situation unfolded, the EOC was unable to obtain a clear operating picture from the field as the common communications channel was overwhelmed and what information was received was conflicting. The ability to gain true situational awareness was also affected by the absence of any formal immediate damage assessment. As outlined in the Damage Assessment module of the Executive Fire Officer Program's Executive Analysis of Fire Service Operations in Emergency Management course, the damage assessment process must be expeditious, accurate, and of

enough detail to enable determination of the sufficiency of resources to control the event (USFA). In some cases, assessment was performed multiple times. Some areas, although assigned, were not evaluated. This single event showed that although the processes addressing emergency management had progressed, there was a lack of commensurate modification dealing with the unique emergency field response needs of severe weather that adversely impact the community.

The window of opportunity to develop objectives specific to a tornado weather event is very small. As time is a factor in all aspects of emergency response, expediency in development and prioritization of objectives and field tasks will greatly benefit the overall safety of the responders and increase the odds of operational success. Further, this process will also aid in the information and intelligence coming from, and distributed to, the field for a stronger sense of situational awareness. The current emergency management structure utilized within the Metro West Fire District has shown benefits in its recent upgrades in facilities, technology and personnel. These changes are directly parallel, and support the United States Fire Administration's operational objectives of "improving local planning and preparedness, improving the fire and emergency services' capability for response to and recovery from all hazards, and improving the fire and emergency services' professional status" (United States Fire Administration [USFA], 2011a, p. II-2). Future success is directly proportional to the reduction in time needed to identify, evaluate, and activate an incident action plan with emphasis on the unique objectives required within the field response realm. When identified, these processes can be applied to an all-hazards approach that expands its vision beyond tornadoes and severe weather and addresses all emergency management functions. As "pre-incident disaster plans are expected to set the parameters for response" (Levinson, 2008, p. 421), the concept of establishing

a sample document that guides the initial actions of responders during the opening moments of tornado events, and that is developed prior to need, is not unrealistic.

Literature Review

The topic of tornadoes and planning provided a large, but general informational array. Narrowing the search topic to incident action planning, emergency management practices, and tornado weather event responses allowed the literature review to focus its vision in relation to the research questions. The National Fire Academy's Learning Resource Center in Emmitsburg, Maryland was utilized during attendance of the Executive Analysis of Fire Service Operations in Emergency Management course in June 2011. Post-attendance research continued at St. Louis University's Pius XII Memorial Library in St. Louis, Missouri; Webster University's Emerson Library in Webster Groves, Missouri; Boston University's Mugar Memorial Library and Northeastern University's Snell Memorial Library in Boston, Massachusetts. In addition to reference materials obtained from these facilities, extensive internet searches were also performed.

The prevalence of disasters or catastrophic events that cause widespread damage and injuries and fatalities are more common today than ever before (Barishansky & Mazurek, 2011). In the United States, the most frequently occurring disasters are natural-related. They are the most difficult to prevent. However, "because most, although not all, disasters (e.g. weather related) are predictable, they should be the easiest to plan for" (Fagel, 2011, p. 2). Because the frequency of events and their impact on our communities is increasing, the need to recognize the value of planning and in particular the benefits of pre-event planning must be identified and embraced (Reddick & Rahm, 2010). The efforts directed within the planning processes prior to

an event must be focused on the issues most likely to be experienced, capabilities and resources (Moeller, 2008). In all instances, disasters can be defined in several ways, and many of the definitions are specific to regional responses and capabilities, but in all cases, the commonality between every event is that it overwhelms all available resources (Beach, 2010). Resource management and the advantages of the planning processes for disasters and pre-event activities have historical roots in the tenets of military battle planning.

Nowhere is the significance of planning and its benefits more prevalent than in military operations. In all instances, military operations are the result of judicious analysis based on capabilities, assessment, resources, and commander's intent (Ruby, 2008). The success of military operations is difficult to measure in the comparison context of emergency management; however, there are close parallels within each. Order of battle plans begin with a strategic analysis of material requirements and processes to manage them, an exhaustive review of the troop and transport needs, and theatre specific needs (Tatham, Oloruntoba, & Spens, 2011). As Thunholm (2006) outlines, each situation presents specific and unique planning requirements, but the battlefield environment contains uncertainty due to a lack of information or false information and time pressure in an arena of high complexity. The battlefield planning processes and concerns directly relate to the challenges experienced by any incident commander. Further, as military operations may not be totally predictable, the frequency of weather and its effects are known. Each has an associated matrix of decisions based on needs and are characterized by the aforementioned uncertainty and the inability to accurately predict outcomes (Tatham et al.).

The tenets of military planning and its component of pre-event strategies are best characterized by an historical analysis of the United States' efforts in World War 2 against Japan. Beginning in 1897, the planning phases for a potential conflict with Japan began. As the

circumstances of politics, naval capabilities, changing strategies, and funding were identified and analyzed, the overall plan of battle, named War Plan Orange, was modified (Miller, 2007). Central to the pre-event plan were the detailed actions to be taken by the respective fleet resources for the anticipated conflict sites. As a testament to the importance of pre-planning and constant evaluation of cause and effect, War Plan Orange was active until 1945, fully 48 years after its initial development (Miller). The outcomes of World War 2 are well documented throughout history. The value placed on pre-planning can also be highlighted during this time period with the knowledge that during War Plan Orange's active lifespan, the United States had at least 23 other "colors" assigned, representing at least rudimentary plans and scope of operations for war with different nations (Miller). The applications of military planning have a direct relationship with the needs of emergency management and response. Concentrating efforts using a prescriptive military method, many of the processes, procedures, and models that show success in orchestrating a battlefield plan should be considered in applications of disaster response, preparedness, and most importantly planning (Kovacs & Tatham, 2009).

As can be seen throughout many examples of large scale battles or smaller operations, success is rooted in the ability to identify needs and anticipate contingencies. Although there may be plans, as noted by Prussian strategist Count Helmuth von Moltke, "no plan survives contact with the enemy" (Miller, p. 333), emphasizing the need for the focus to be on the process that supports and influences the outcome. The significance and doctrines of military planning and their benefits to emergency management are best summarized by General Dwight D. Eisenhower's statement of "plans are worthless, but planning is everything" (Kramer, 2009, p. 12).

The concept of analysis planning for a suspected event in the context of emergency management prior to its occurrence must encompass the anticipated hazards and capabilities by those knowledgeable and capable (National Fire Protection Association [NFPA], 2009). Supporting this theory, the element of the pre-event plan must be based on prearranged decision protocols. These protocols effectively allow responders to concentrate on the tasks at hand by identifying order and preference of operations by establishing "authority, saving time, preventing confusion, and preserving unity of effort" (Kapucu, 2008, p. 317). Fluidity and flexibility are key attributes of the decision protocols that comprise a well researched pre-event planning template (McConnell & Drennan, 2006). The overarching element of the process must produce an end product that is understood, capable of being implemented, realistic in its objectives, and relevant to the event.

When considering the decision protocol theory outlined by Kapucu and the resulting planning product, an understanding of specific cause and effect analysis of severe weather events is helpful. Tornados, severe thunderstorms, squall line fronts, and straight-line winds are unique weather events, but they all share a common denominator: higher than normal wind velocities (NOAA, 2011). These wind velocities cause various levels of damage and can be used as a predictor for a presumption of the estimated structural damage and injuries anticipated based on historical analysis (Brooks, Doswell III, & Sutter, 2008). From the planning perspective, an overall vision of the types of damages and injuries resulting from tornado and thunderstorm events may be developed utilizing the historical viewpoint; however, local building construction, risk populations, and expanding vulnerabilities mandate that a specific plan that addresses all eventualities unique to the jurisdiction be the focus of efforts (Ashley, Krmenec, & Schwantes, 2008).

The processes of evaluation and analysis prior to and during an event constitute planning (Kramer, 2009). The result of this effort should produce some type of guiding document or plan that can be utilized during the event. This document or plan is officially referred to as an incident action plan. The IAP is beneficial in that "anyone who arrives on the scene or participates in the event can gain situational awareness of the event within minutes of looking at an IAP" (Martinez & Lynch, 2007, p. 66). As a planning document, the IAP may look very different based on the type of event, the time available to develop it, the capability and presence of resources, and the number of personnel needed for the operation (Deal, de Bettencourt, Deal, Merrick, & Mills, 2010).The ability to transmit a common operating picture based on current status is the objective of the IAP (National Fire Protection Association [NFPA], 2010a), but in many instances, the difficulties encountered in developing the plan center on what information is relevant to the event (Strickland, 2010).

Regardless of the scope of the event, the minimum elements required of an IAP are based in the Incident Command System (ICS) forms that are a component of the National Incident Management System (NIMS). The type of event will dictate the specifics of the forms; the amount of time and resources will determine the volume, with the suggested minimums being the ICS-202, Incident Objectives, including a general safety message, the ICS-203, Organizational Assignment List, and the ICS-205, Incident Communications Plan (Martinez & Lynch, 2007). These documents provide a foundation for allowing the incident commander to best outline intent through objectives and responsibilities through a valid communications process. As the process of developing the IAP unfolds, the key element required is information that through analysis will become the basis for operational objectives (Unites States Fire Administration [USFA], 2009).

One of the primary operational objectives noted for a severe weather event is the safety of all responders (USFA, 2011b). This is a consideration in all instances of deployment of emergency field personnel. These personnel now become the vital communications link in providing the commander situational awareness through damage assessment. Damage assessment, both to the agency's resource capabilities and the community itself, concentrating on residential areas and likely commercial properties impacted by wind, should be valued as a high priority objective and performed by reconnaissance strike teams (Walker, 2011). The process of evaluating the damage to a community should occur in concert with a plan that details the location of at-risk populations, such as the elderly (Pekovic, Seff, & Rothman, 2008) and their specialized needs. If the needs of the at-risk groups unique to the jurisdiction are not considered, resources can quickly become overwhelmed (Smith, Tremethick, Johnson, & Gorski, 2009). The value of a comprehensive process that evaluates the impact to a jurisdiction in the opening moments of a disaster event cannot be overemphasized. How this information is utilized is directly proportional to the success of managing the event (DeAtley, 2011).

The overall data captured from the damage assessment processes and procedures is best utilized when incorporated into a system of graphic representation that integrates with data arriving from the field (Kiltz & Smith, 2011). As described, the value of a geographical information system (GIS) is crucial to documenting and gaining situational awareness. Throughout the event, incoming data can be transferred onto subsequent informational layers for further analysis (Grainer, 2011). Further expanding on the value that GIS offers to emergency managers, the expanding or cascading event can be sub-divided into smaller, manageable zones (Williams & Etheredge, 2009). These zones may be evaluated for ingress and egress routes (Schafer, Ganoe, & Carroll, 2007) and may include separate search and rescue grids, staging

areas for public safety resources or incoming non-public safety assets (Levinson, 2008). The ability to quickly identify resources, map damages, and project needs is greatly aided by employing a GIS that interfaces with property and at-risk population databases (Smith et al., 2009). Although an important aspect of the overall emergency management system, damage assessment and GIS capabilities are not the only focus of a pre-event IAP.

The planning processes for severe weather event must incorporate the likelihood of injuries. Depending on the scope of the event and its location, these may few in number to mass casualties. A critical component in the complex machine of emergency management is the hospital system. From an historical perspective, “medical treatment facilities have demonstrated their importance in disaster response” (Harrison, Harrison, & Piermattei, 2008, p. 355). A major operational objective must be nominated within the IAP addressing the challenges faced when multiple and critical injuries are encountered and must be transported to appropriate facilities with a limited number of resources so as to not overwhelm the receiving facilities (Auf der Heide, 2006). Within the pre-event IAP, this situation can be managed by proactive communications with area medical facilities so they are “apprised of the current situation including numbers of victims and possible causative agents” (Powers, 2008, p. 566). By enacting an effective communication plan early, surge capacity, the influx of patients immediately after a disaster, either by self-transport or through public safety intervention, can be predicted and better managed (Powers). The planning processes needed for pre-event severe weather occurrences and the resultant product are well documented. This process, although necessary and beneficial, has associated challenges in development and implementation.

The concept of preparing for an as yet to occur event may seem practical to the emergency management and response world, but this viewpoint may not be shared throughout

the organization. In particular, when comprehensive disaster management planning is analyzed, most jurisdictions allocate the task as a low priority (Kusumasari, Alam, & Siddiqui, 2010). Further, because developing a plan relies on experience and expertise, there is a marked tendency to delay or avoid the process, particularly with the frequency of expanding events being much less and a misconception that disaster response is similar to any other emergency, "except on a grander scale" (Fagel, 2011, p. 4). As with any program, there are also political considerations. In many cases, there may be conflicting organizational goals, cultures, and resources (McConnell & Drennan, 2006), or the unwillingness or inability to initiate the process (Kusumasari et al.). As noted by McEntire (2008), "emergency management has never been guided by coherent theoretical insight; instead it has often been directed by political perspectives or practical necessity" (p. 303).

These facts considered, it is understood that any activity performed by an agency has an associated cost; planning is no exception. The funding available for emergency management planning activities has been reduced dramatically. Although these reductions are a given, the situations that surround disasters have not decreased commensurately. This creates further challenges to exploring where to generate funding for the planning process. "Denial doesn't cost anything, but the human and societal cost of that denial will be extreme in the wake of a disaster" (McPherson, 2011, p. 35). This cultural acceptance of denial may permeate throughout the organization and further challenge attempts at initiating a thorough planning process, but will also influence implementation.

The challenges experienced in developing a pre-event action plan are certainly formidable. When these obstacles are addressed, the presumption is understood that an enforceable plan may become available. One of the primary difficulties experienced in the

processes surrounding implementation is apathy. As previously noted, an organizational culture that may have institutionalized attitudes, apathy, and lack of support for disaster planning is certainly apparent when implementation is considered (Kusumasari et al., 2010). In addition, the planning process may have produced a shell document with the inability to fund the resources required to implement the plan (McConnell & Drennan, 2006). Although the challenges of apathy and revenue present hurdles to success, there are operational considerations that also affect plan enactment.

The likelihood of implementing an operational pre-event plan is directly proportional to the command and management structure. As outlined by Van Helden & Stewart (2008), clearly defined roles and positions staffed by qualified personnel increase the probability of success. The ability to staff required positions may be difficult, but a strong command presence with forward anticipatory vision can reduce the factors working against the plan (Shouldis, 2010). Throughout the initial stages of the event, another consideration that impedes plan implementation and challenges every command structure is communications.

Communications are an essential component of any operational activity and are a double-edged sword. A lack of, or poor communications, have been identified as one of the top three problems associated with less than desirable outcomes during disaster activities (Kramer, 2009). The ability to send and receive messages must be evaluated within a pre-event plan as "catastrophic disasters cause disruptions to normal communications channels" (Kapucu, 2008, p. 315). A detrimental effect may be experienced in both private and public sector communications infrastructure as a result of the event. Addressing these concerns must be considered a priority objective within the scope of any severe weather plan (National Fire Protection Association [NFPA], 2010c). There are different options available to consider where communications issues

are identified, but the overarching theme within disaster applications centers on the geographic size of the incident and the number of resources required for operations.

Disaster operations continue to be plagued by lack of coordination and standardization between responders and other organizations (Kiltz & Smith, 2011). The ability to organize communications rationally among large numbers of public safety resources and assure that the right person talks to the right person is essential (Moeller, 2008). The pre-event communication planning process should identify the potential assisting agencies and seek to develop strategies that leverage interoperability to decrease the challenges in implementing a plan (Alkhalaf, 2011). Interoperability is important when the potential number of agencies and resources are evaluated in the context of widespread geographic occurrence. As severe weather events develop and unfold, the need for information is crucial; this applies not only to the incident commander but to the general public as well.

Although not immediately recognized as a traditional challenge to plan implementation, the presence of media and the incident commander's ability to control the messages they are broadcasting must be evaluated. It is a given that media should be anticipated to be everywhere. Because of the uncontrolled nature in the opening stages of severe weather disasters, there may be tendencies for media to issue false warnings or contradict information that may hinder emergency management processes (Asgary & Tajadod, 2011). These issues will certainly challenge the command management structure, but a key asset in the process is the enactment of a centralized information center where public safety staff can develop a unified message and media can disseminate factual information that furthers the emergency management function (Asgary & Tajadod). The dichotomous nature of communications must be accepted and addressed within any pre-event plan to improve the odds in successful implementation.

The specific elements and information of emergency management planning in a pre-event context are specific to each jurisdiction based on resources, revenue, and politics. Within St. Louis County, Missouri, this is no exception. To gain insight into the practices that affect the Metro West Fire Protection District's planning processes, the Director of Emergency Management for St. Louis County, Mike Smiley was consulted for his opinions on pre-event tornado planning, as OEM is a critical link in the emergency management chain for both the county and Metro West. Generally, the most important information that is required in a pre-event setting is the knowledge of the potential scope of the incident and the critical infrastructures within the target area. The facilities that should be identified early for priority reconnaissance include hospitals and long-term care facilities. The processes of damage assessment will best be served within the initial reconnaissance; emphasis should be placed on gathering as much information as possible, to include ingress and egress, status of staging areas, and also probable resource needs. The value of a strong GIS function will be evident within this phase as the information becomes actionable intelligence for situational awareness.

The pre-event tornado IAP should be primarily based on objectives for the initial operating period, establishing communications, and detailing work assignment for the initial first responders. The major objectives should include overall responder safety, search and rescue, accountability, preliminary damage assessment, and identifying all agencies and jurisdictions with responsibility within the incident.

The literature review provided a range of informative answers to the research questions. In regards to analyzing what information is needed for a pre-event tornado incident action plan, the available published data is limited when specifics surrounding tornados is concerned. The information that is relevant shows that many of the tenets of overall incident management

planning are applicable, but must be focused on identifying hazards prior to the event. Additional data in this area will be beneficial in this study. The challenges in developing a pre-event plan are well documented and focus on revenue, culture, and resources. Similarly, these same issues are present when evaluating the challenges in implementing a pre-event tornado incident action plan. Additional data is required to refine this area of the study.

The information acquired from the interview with the Director of Emergency Management for St. Louis County, Missouri was beneficial to this study in that the specific requirements pertinent to the Metro West Fire District's emergency management function were explored. Further, as the information provided is deemed a true representation of the requirements and challenges of pre-event planning and are currently employed for operational needs, the data will be vital when combined with a best practices approach for the action research model.

This literature review influenced the scope and direction of the study by identifying the need for more data targeted towards the information required in, and the challenges of developing and implementing, a pre-event tornado incident action plan. The procedures for the study will address the need for further data collection in the aforementioned areas.

Procedures

A literature review began during attendance of the Executive Analysis of Fire Service Operations in Emergency Management course from June 13, 2011, through June 24, 2011. The National Fire Academy's Learning Resource Center provided a comprehensive collection of industry-specific material pertaining to emergency management, weather emergencies, and incident action planning practices. Various search terms, such as "emergency management, tornado operations, incident action plans, planning, and pre-event planning" were used to guide

the on-campus search. Additional research and literature review continued post-attendance at St. Louis University's Pius XII Memorial Library in St. Louis, Missouri and Webster University's Emerson Library in Webster Groves, Missouri during July of 2011, and visits to Boston University's Mugar Memorial Library and Northeastern University's Snell Memorial Library in Boston, Massachusetts from August 4, 2011 to August 11, 2011. The fifth edition of the Publication Manual of the American Psychological Association was used to document references and citations throughout this research study.

The analysis of the literature review provided direction as to the need for more specific data from fire agencies in the areas of pre-event incident action plan information and the challenges in developing and implementing a plan. Obtaining this data was accomplished through the design of a survey instrument and an interview with the Director of Emergency Management for St. Louis County, Missouri.

A survey instrument for general fire department distribution was designed to obtain data on the use of incident action plans, pre-event incident action planning, information needed for a tornado pre-plan, and the challenges of developing and implementing a pre-event plan (Appendix A). This survey was designed using a web-enabled survey solution from *formstack.com*. The survey and its link were requested for inclusion to the National Society of Executive Fire Officers (NSEFO) mail list and the United States Fire Administration's Training and Data Exchange Network (TRADENET) on October 12, 2011. At the time of the requests, NSEFO had 733, and TRADENET 33,203 registered members respectively.

The opinions and best practices viewpoint from an emergency management perspective was obtained from Mike Smiley, the St. Louis County, Missouri Director of Emergency Management. Mr. Smiley was contacted by telephone on October 11, 2011, to ascertain the best

method of conducting a brief interview. Due to schedule loads, the decision to conduct the interview via electronic mail was made. The narrative questions (Appendix B) sought data on the elements and information contained in a pre-event IAP and the challenges of developing and implementing a pre-event tornado IAP. The questions were included in the body of an electronic mail message sent on October 11, 2011.

Survey returns were closed on November 15, 2011, and tabulation, analysis, and charting were performed using Microsoft Excel.

The limitations to the procedures set forth for this study include the potential of low return rate from the survey instrument and incomplete surveys resulting in the potential of sampling bias (Leedy & Ormond, 2010). Additional limitations in the form of internal validity threat are noted in the interview with the Director of Emergency Management for St. Louis County. Mike Smiley has conversed on the concepts, design, feasibility, and feedback for the emergency management program at Metro West and holds a vested interest in its ability to support the overall St. Louis County plan; responses may be weighted towards a positive outcome (Creswell, 2009).

Results

Analysis of the returned surveys was used in developing and refining answers to the research questions. In analyzing returns as to the utilization of an IAP, the processes of pre-event planning, the information needed for, and challenges in developing and implementing a pre-event tornado IAP, the number of surveys returned was 119. The distribution audience for the survey was calculated at 33,936 using figures supplied by the USFA and NSEFO. This reflects a return rate of 0.003%.

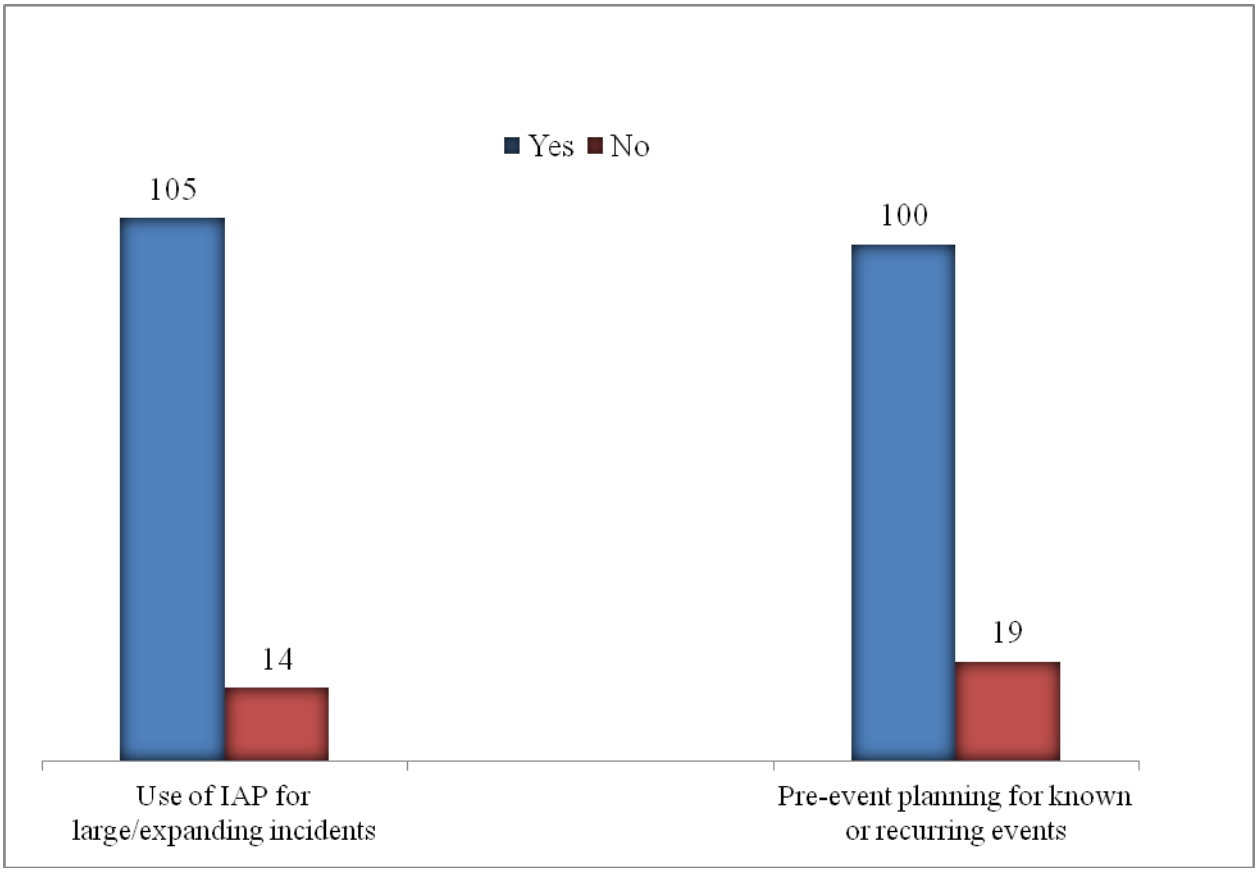

Figure 1. Responses of fire agencies (n=119) as to the use of an IAP for large or exapnding incidents and the use of pre-event planning for known or recurring events.

Of the surveys returned, 88% of the respondents utilize an incident action plan for large or expanding incidents while 84% of the responses noted some type of pre-event planning for recurring or known events. The information required to produce a pre-event tornado incident action plan were noted on 96 of the returned surveys with 26% noting the location of shelters, 14% the transit routes, including ingress and egress, 21% the current staffing levels, 30% a communications plan, 21% a logistics plan, 26% the availability and capabilities of mutual aid resources, 9% a GIS component, 20% a critical infrastructure and key resource status, 19% the results of a vulnerability assessment, 16% a hospital and medical treatment plan, 5% a damage

assessment process, 21% initial incident objectives, 18% a current and projected weather forecast, and 12% an evaluation of past history of weather events (see Table 1).

Table 1

Information Needed to Produce a Pre-event Tornado IAP (n=96)

IAP Information	Number of Responses
Shelter locations	26
Transit routes	14
Staffing levels	21
Communications plan	29
Logistics plan	20
Mutual aid resources and capabilities	25
GIS mapping component	9
Critical infrastructure and key resource status	19
Vulnerability assessment	18
Hospital and medical treatment plan	15
Damage assessment process	5
Initial incident objectives	20
Weather (current and forecasted)	17
Evaluation of past weather events	12

Challenges to developing a pre-event tornado incident action plan were noted on 100 of the 119 returned surveys. Twenty three percent report the challenge of an uncertain location of impact, 23% lack of training, 10% political issues, 9% organizational culture, 6% communications issues, 8% logistics issues, 19% involvement of other agencies and disciplines, 12% the scope of the incident, 6% lack of equipment staging areas, 16% the lack of time and experience to develop a plan, and 17% the lack of revenue or funding as the challenges to developing a pre-event tornado IAP (see Table 2).

Table 2

Challenges in Developing a Pre-event Tornado IAP (n=100)

Challenge	Number of Responses
Uncertain location of impact	23
Lack of training	23
Political issues	10
Organizational culture	9
Communications	6
Logistics	8
Other agencies and disciplines	19
Scope of incident	12
Equipment staging areas	6
Time and experience	16
Revenue or funding	17

Pre-event tornado incident action plan implementation challenges were present in 103 of the 119 returned surveys. Two percent reported lack of experience in planning, 3% the loss of key planning personnel, 7% buy-in from the players, 24% training and exercising the plan, 6% unified command issues, 10% other agencies and disciplines, 11% plan maintenance, 7% lack of funding, 11% political issues, 12% communications issues, 10% lack of initial incident objectives, and 14% logistics delays as the main challenges (see Table 3).

Table 3

Challenges in Implementing a Pre-event Tornado IAP (n=103)

Challenge	Number of Responses
No experience	2
Loss of planning personnel	3
Buy-in from the players	7
Training on, and exercise of the plan	25
Unified command issues	6
Other agencies and disciplines	10
Plan maintenance	11
Lack of funding	7
Political issues	11
Communications issues	12
Lack of initial incident objectives	10
Logistics delays	14

The information required for a pre-event tornado IAP as noted in interview responses (Appendix D) with Mike Smiley, Director of Emergency Management for St. Louis County, Missouri, should be rooted in identifying and developing the initial operating period's objectives, which would include overall responder safety and accountability; location, removal, treatment and transport of victims; initial and rapid damage assessment, and identifying all agencies and jurisdictions with responsibility within the incident. Additional tasking would also include establishing communications, to incorporate a system of notification for the hospital networks and a logistics plan that tracks all of the resources required for the incident. The challenges to pre-event planning are noted to be resistance to change and the need for revenue.

The St. Louis County Office of Emergency Management Decision Support Template (Appendix E) provided information to assist in the pre-event tornado incident action plan produced for use within the Metro West Fire District (Appendix C).The document contains a listing of the initial incident objectives, including critical facility status and damage assessment activities, hospital notifications and emergency medical service triage and transport plans, pre-designated geographic equipment staging areas, and a communications plan for command and control of the incident.

Discussion

The findings of the study are based on an inferential analysis of data and are influenced by the low return rate in the survey instrument and may produce sampling bias (Leedy & Ormond, 2010). The data analysis shows an overwhelming agreement with the literature review where planning is concerned. The value of knowing agency capabilities and also those of the mutual aid providers must be a component of any planning process to maximize the benefits of the effort (Moeller, 2008). As a major percentage of the respondent agencies practice some type

of incident planning through the use of an IAP, this highlights the importance that pre-event efforts can have on the eventual outcome of a major incident (Thunholm, 2006). Although the use of a plan has been shown to be an effective tool, there still exists resistance to change, especially when the culture of planning and emergency management is examined in the context of field operations. One of the biggest challenges the author has seen throughout jurisdictional and multiple state deployments for severe weather has been the difficulties encountered transitioning from emergency field operations to tasking focused on emergency management. As can be expected, it is difficult for responders to transition into a mode of operations that may contradict training (Kramer, 2009) that emphasizes immediate actions where encountered. The fact that a tornado weather event will produce widespread damage necessitates that knowledge of the scope of the event must be obtained to develop actionable incident objectives (Kapucu, 2008). As noted throughout the data set, this fact causes major issues to developing a plan. This area of concern is most prevalent within the Metro West plan as was exposed during the December 31 tornado. Without a clear set of incident objectives and company level tasking assignments emphasizing emergency management principles, the damage area was a draw for any unit in the vicinity with many of the operations focused on single structures with multiple resources. This led to an environment that fostered freelancing and caused delays at the command level in addressing the needs of the wider damaged areas. These issues are also present in the data set and are confronted through aggressive training on the plan, both administratively and tactically. A training component is the single most effective tool for maintaining efficiency. In most cases, the plan will be exercised more frequently than it is activated (Fagel, 2011).

The value of situational awareness cannot be overemphasized. The information needed for an IAP has been shown through best practices to be rooted in situational awareness gained through a damage assessment process that focuses on critical infrastructures. As the value of damage assessment is examined, a particular point of interest developed through analysis must be noted; area reconnaissance. A wealth of information can be obtained by maintaining vigilant awareness of surroundings on the inbound leg of a damage assessment assignment. Information such as transportation routes, area damages, overall scope, and population affected can be recorded and forwarded. This can be obtained from multiple units to rapidly advance the commander's knowledge of needs (Ruby, 2008). This information is critical in developing two of the most important tactical considerations: search and rescue and medical operations.

The importance of locating, removing, and treating victims is a primary tactical objective. Because of the nature of severe weather events, this task must be focused on accuracy with an element of urgency. The most effective method is through a system of coordinated grid patterns that ensure complete and thorough searches. One of the few methods that prevent duplication of effort is a robust GIS component (Kiltz & Smith, 2011). As noted in several survey comments, the GIS element is critical in not only field level operations, but also at the command level to gain situational awareness and develop future objectives (Schafer et al., 2007). When analyzing the value of GIS in emergency management, the areas of medical operations must be included. In conjunction with the area reconnaissance, a determination can be made on the number of injuries present. This information will drive the processes that build the critical medical operation and transportation plan. Again, the author's experience in severe weather deployments shows that the most beneficial aspect of medical operations and transportation is the presence of viable plan. This plan must incorporate the caveat of transport unit personnel. There are a limited number of

units available to physically transport victims; the personnel assigned to these units must not become integral components of a search and rescue operation. They must remain as the vital transportation link to the treatment facility (Harrison et al., 2008). Additionally, the overall medical plan must incorporate early notification to the treatment facility. This action must be a priority within both the medical and communication plans to ensure additional resource needs are identified and critical personnel are available to assist with objective development (Powers, 2008). In evaluating further strategies to address injuries, the presence of pre-designated treatment areas is also a consideration. The damage area will certainly include the potential for injuries, but efforts to relocate these injuries to another area that is equipped for treatment and eventual transport should be considered. The efforts to locate, remove, treat, and transport injuries is a priority; the needs of the non-injured and displaced must also be evaluated.

The issues of shelter locations and status have always been a challenge within emergency management. In most instances, the numbers of displaced persons will greatly outnumber the injured, thus magnifying the importance of this task. The benefit of including this information in the pre-event planning process within the Metro West plan allows the commander to have working knowledge of capacity prior to the event. This assists in supporting the logistical efforts towards the displaced population, which will include the elderly and infirmed (Pekovic et al., 2008). Just as noted in the search and rescue and medical plans, this information must be incorporated into the GIS layers to support decision making.

The overwhelming majority of the information gained from the surveys coupled with personal observations points to the importance and criticality of a detailed communications plan. As noted by Kramer (2009) and many of the study participants, the lack of communications is the leading cause of plan failure. The customized needs of the Metro West plan dictated that the

resources from the various mutual aid agencies have an interoperable component for radio communications (Alkhalaf, 2011) as many of the outlying agencies that would support severe weather operations do not benefit from a CAD enabled mobile data terminal. These issues are easily rectified through a detailed plan that is published prior to the event and exercised through vigorous training (DeAtley, 2011). In addition, the value of dispatch capabilities is leveraged within the Metro West plan by a system of call prioritization that evaluates requests for service and assigns resources based on the emergency management priorities identified within the elected initial incident objectives (Walker, 2011).

The results of this study show that the action research method was beneficial in producing a pre-event tornado IAP and that the overall success of the emergency management pre-event planning culture within Metro West is well aligned with other agencies when a best practices approach is analyzed. The areas of concern for many of the respondent agencies mirror those of the Metro West Division of Special Operations where information and challenges are concerned. An area noted that does not currently affect the organization is a funding component. The current success of the emergency management program can be directly attributed (McPherson, 2011) to a funding stream and political support that allows goals and objectives to be attained. This area will need to be closely evaluated to identify resources and procedures to continue advancing the processes of pre-event planning.

The data set clearly indicates that for the Metro West plan to be successful, a training component must be incorporated that outlines the plan and includes detailed field procedures. The latter appears, on the surface, to be one of the biggest challenges as emergency management principles relating to tactical field operations have not been accepted as a culture (Kusumasari et

al., 2010) within the organization. The fact that the number of severe weather events increases each year only magnifies the importance of developing solutions to this issue.

Recommendations

The results highlighted in this applied research project lead the researcher to conclude that there are opportunities for improvement in the Metro West Fire District's emergency management program in the areas of future planning, education, and training. The following recommendations are offered for achieving these levels of improvement:

1. Present the pre-event tornado IAP to the Board of Directors for adoption and integrate into the Preferred Operating Methods of the policy manual.
2. Develop a training program for the pre-event tornado IAP that includes plan familiarization and exercises for emergency management personnel and each section.
3. Develop a training program for tactical level first responders that utilizes the pre-event tornado IAP and focuses on the initial incident objectives and their importance to plan success
4. Identify additional funding mechanisms to ensure the current emergency management processes are sustained.
5. Expand the pre-event planning processes to include an all hazards approach to develop additional IAP's for all known or suspected hazards
6. Research and develop an applicable preliminary damage assessment process to incorporate into future revisions of the plan.

Recommendations for future researchers interested in replicating this study are based in the difficulties experienced in validating data. A tremendous effort was expended in categorizing the responses from the surveys into generalized topics for analysis. This burden

could have been reduced through the use of a multiple choice, check box format in the survey. With this said, the researcher's choice of a narrative system was intended to reduce the presence of bias by allowing the respondents to freely provide their opinions to the research questions and not what the researcher provided as choices.

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Appendix A

EFO Pre-Event Tornado IAP Survey

My name is Ed Beirne, Assistant Chief with the Metro West Fire Protection District. I am asking for your assistance with an EFO applied research project for my third year EAFSOEM course. Please take a few moments to provide some feedback on the use of an incident action plan. I appreciate your assistance in this project.

Department Name and Location*
Location is City and State/Province/Country

Does your department utilize an incident action plan for large or expanding incidents?*

- yes
- no

Does your department perform any pre-event incident action planning for known or frequently occurring incidents? *

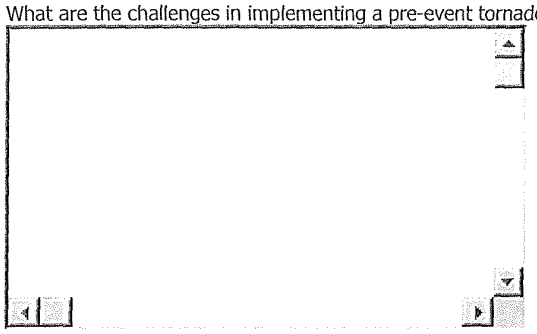
- yes
- no

Please consider the situation of a tornado weather event for the following questions.

What information is needed to produce a pre-event tornado incident action plan?*

What are the challenges in developing a pre-event tornado incident action plan?*

What are the challenges in implementing a pre-event tornado incident action plan?*



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Appendix B

Interview Questions for Mike Smiley

I am working on an applied research project as a component of my Executive Fire Officer Program through the National Fire Academy. My project focuses on emergency management and operational practices regarding tornados. Specifically, I am trying to develop a pre-event tornado incident action plan template. As the Director of Emergency Management for St. Louis County, Missouri, I would like your professional input and also opinions on emergency management practices. I have four questions that I would appreciate your thoughts on regarding pre-event planning:

1. In your professional opinion, what are the components of a pre-event IAP?
2. What should the primary and initial objectives be?
3. What are the challenges in developing a pre-event tornado IAP?
4. What are the challenges in implementing a pre-event tornado IAP?

Thanks for reviewing the questions and your responses. Please contact me if you have any questions.

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Appendix C
Metro West Fire District Tornado Operations Objectives Plan

9050 Tornado Preferred Operating Methods

Scope: These preferred operating methods have been developed to provide basic operating methods for the personnel responding to and arriving on the scene of a tornado weather event. These methods are consistent with the tactics and strategy philosophy of the Metro West Fire Protection District.
It is not all-inclusive and cannot cover all of the possible situations that personnel may encounter.

Initial Incident Objectives

- Ensure the safety of all responders during all operations
- Evaluate impact area for situation status and resource needs
- Locate, remove, triage, treat, and transport all injured victims
- Stabilize damaged structures for safe access
- Extinguish all fires
- Evaluate and neutralize hazardous conditions when encountered

Immediately following a tornado, wind shear, straight-line winds or other severe storm-like incident:

Engine/Ladder Companies

- Communicate with CCEDS status in or out of service.
- Check fire station and any associated buildings for structural damage.
- Perform damage assessment and reconnaissance of immediate respective area (or as assigned by Metro West Area Command) and report to MWAC as soon as possible.
- Ensure all operations meet MWFPD safety guidelines.
- Begin search and rescue operations in affected area(s).
- Monitor CAD MDT's for status updates and communications from MWACP

LSV Companies

- Communicate with CCEDS status in or out of service
- Check fire station and any associated buildings for structural damage

- Perform damage assessment and reconnaissance of immediate respective area (or as assigned by Metro West Area Command) and report to MWAC as soon as possible.
- Begin evaluation of triage needs in the impact area and establish casualty collection point(s)
- Begin evaluation of area transit routes for victim evacuation
- LSV units are discouraged from committing to search and rescue operations; transportation capabilities must be the priority

Command Personnel

- Activate Metro West EOC and staff IC, Safety Officer, PIO, Operations Section Chief, Rescue Branch, Fire Branch, and EMS Branch positions
- Establish divisions as necessary utilizing the map grid system.
- Activate GIS processes and functions (as needed)
- Enact communications plan to initiate Emergency Management call prioritizing and CAD messaging; Communications frequencies assigned as follows:
    - Primary for field units operating within the impact area – Command C
    - Staging area units – Command D
    - Alternate for field units operating within the impact area – Command E
- Chief Medical Officer to begin administrative hospital notifications (via SMOC) as to event and casualty information.
- Activate geographic equipment staging areas:
    a. North- Fountain Plaza Complex; Clayton & Clarkson Rd; Map 33-031
    b. South- Selvidge Middle School; 235 New Ballwin Rd; Map 33-056
    c. West- Lafayette High School; 17050 Clayton Rd; Map 33-025 & 33-047
- Press releases to be issued through PIO/JIC at 60, 90 and 120 minutes; as needed thereafter.

Appendix D
Interview Responses from Mike Smiley

The key to pre-event planning is recognizing that there are tasks that must be addressed prior to an event for any chance of success during the emergency response phase. One of the first tasks that I envision your process excelling at is the intricate knowledge that you possess of your jurisdiction. This is a huge factor in developing your objectives because you already know where your trouble areas lie and probably have a good idea of the resources you'll need. The knowledge of where your critical and key facilities are located really aids in this portion of plan development.

When I examine the component of a pre-event IAP, I really see the document weighing heavily on the objectives that you are most likely to experience in a tornado. From experience, many of these are the same for every expanding incident, but there should be at a minimum a plan for ensuring safety of the responders, a way to communicate what you want your field assets to accomplish, and some type of system to account for, and track, all of the resources that you have currently deployed and certainly what you'll be requesting from us. Another major consideration that may be delayed when you're first activating resources is the early identification of the scope and number of injuries. The sooner this is relayed to the hospitals, the better. I'm sure you're aware of the St. Louis Medical Operations Center (SMOC). This would be the communications portal of choice for this task and would benefit the overall incident as SMOC would then detail a hospital IC to your EOC for assistance in managing the incident.

I believe any type of pre-event planning will have challenges. I'm not sure exactly what they would be within your organization, but my experience has shown that there is always resistance with anything that involves change. Another factor that affects everyone right now is revenue. Any plan will have a cost and depending how it is developed, that may cause trouble

when you try to put it into effect. Any plan can be great on paper, but if you cannot locate resources to support it, the plan may fail or be severely limited in its effectiveness.

I have also attached a template that I put together for your information request that I hope will be beneficial for your project.

Appendix E

St. Louis County Office of Emergency Management Decision Support Template

Information Categories: needed for pre-event planning:
Potential scope: Amount of land mass and population at risk, population densities.
Known hazard potential: locations of EHS facilities, other likely hazmat storage

- (chlorine, ammonia storage, known manufacturing process, etc)

Potential mass casualty locations: (rated by estimated gathering potential and number of hours in-condition)

- gathering points, large roof-span buildings,
- high schools,
- malls,

Known functional needs facilities/locations: (LTC facilities, treatment centers, etc)
Know functional needs – private locations: Functional needs registry, Ameren electricity dependency registry, dialysis patients,
Critical Infrastructure/Key Resources:

- Department facilities/houses, equipment storage, admin, etc.
- Hydrant locations
- Equipment suppliers in District (external)
- Staging locations – personnel, equipment, utility, etc
- PSAPs – Central County E911 and back-up dispatch, Ballwin PD
- Federal facilities or financial/banking (sensitive materials) locations

Potential Shelter/Mass Care facilities/locations (rated by capacity and management capability): Schools, Community Centers, etc
Transportation Infrastructure: (rated for traffic capacity – normal and rush-hour)

- Key response routes (alternate routing)
- Key access points to functional needs locations
- Choke-points
- Bridge or building disruption potential
- Primary debris clearance designations

Transportation Navigation:

- Street map, subdivision map with name and numbering designations
- Landmark alternatives, monuments and permanent signage /references

Available Park Grounds: local, county, state (secure areas for staging, mass care, etc)
Land Use Classifications: associated infrastructure complications, utility service capacities,

- Commercial structures (layout configurations relative to people & hazmat)
- High-rise / off-set response requirements/complexity

Apartment/Multi-family complexes: mass casualty, search and rescue, mass sheltering potential
Non-English Speaking Concentrations:
Medical Services Facilities:

- hospitals, alternate care, treatment facilities,
- medical transport, high capacity med transport/buses

PODS – Points of Commodities Distribution: potential points such as school or mall parking lots with multiple ingress/egress, etc
Communications Critical Infrastructure: public safety radio towers, cell provider tower coverage areas.

- Topography – locations for repeaters based on "high points"

Communications Operations: Radio systems and frequencies

- Primary, alt and mutual aid
- Special team (Federal teams, etc)

Utility Infrastructure: Identified CI/KR according to each utility service provider.

- Lift stations, pumping sites, high-capacity step-down, etc
- Power-dependent network control facilities,
- High-power transmission line "fall patterns" / risk areas

Railroad/rail line infrastructure: functional needs, population exposures within identified hazard zone, bridge/trestle,
Political Infrastructure: elected representatives of potential impact areas.

- Potential areas in which Federal authority will supersede

Geographic Infrastructure: designated division assignments (or Branch level geographic assignments with corresponding Division level subs)

- Branch/Division configuration rated or sized by complexity

Personnel/Staffing: minimum (initial maximum) staffing patterns by geographic assignment (with overhead capacity)
List of Potential "initial" Operational Period Objectives: (See list below)
"Variable" Organizational Structure for Initial Operational Period: Available command level supervisors/overhead
Potential Casualty Collection Points: ALS Unit access, helispot compatibility, proximate to "potential MCI locations" / high density facilities.
Mutual Aid Requirements: Equipment & overhead for anticipated TF and ST

- Staging and assignment (variable)
- Access to heavy equipment – local Public Works/Streets Departments and types/categories of equipment

Livestock/Animal/Exotic Pet Registry:

- Known commercial livestock operations
- Kennels and boarding facilities
- Alternate boarding / sheltering facilities

Public Information/Media Coordination:
- Media contacts / representatives
- Designated briefing/conference locations
- Approved media statement policy

Available Volunteer and Faith-based Organizations:
- Group designations and contacts
- Group specialties, capabilities and capacities (including training and supervision)

Anticipated Effects of Variable Impact Potential: Information Needs:
Type/Classification of Incident: EF scale event
Time Period: either extended daylight, minimal daylight, partial night or extended night.
Scope and extent of impact area: impact area contained within district, external areas?
Onset of incident: warning lead time, protective action allowance

Components of a Pre-event Tornado IAP:
Incident Objectives

First Operational Period:
- Provide for the safety of the public, and a safe work environment for all responders.
- Perform search/rescue and prevent further exposures to the public
- Account for all responders (and the public) in the affected area.
- Prepare an incident Safety Hazard Analysis/Mitigation plan
- Prepare a Site Safety plan.
- Immediately initiate a 2 to 1 work-rest ratio to manage responder fatigue.
- By _____hrs, identify current and potential hazardous materials releases and potential impacts to the public and environment.
- By _____hrs, complete preliminary damage survey.
- By _____hrs, complete full damage assessment.
- By _____hrs, establish HAZMAT remediation activities and estimate target completion time.
- Identify all agencies and jurisdictions with responsibility for the incident and obtain assisting and cooperating agency representative names.

Safety:
- Provide for the safety and welfare of citizens and response personnel.
- Provide for the safety and security of responders as well as maximize the protection of public health and welfare.
- Identify safety and risk management factors and monitor for compliance for both the public and responders.
- Implement practices that allow for the safety and welfare of the passengers and non-essential crew.
- Conduct Operational Risk Assessment and ensure controls are in place to protect responders and the public.

Search and Rescue:
o Locate and evacuate all passengers and crew.
o Evacuate victims to medical transfer areas or facilities once rescued from immediate peril.
o Establish medical triage along with transport to hospital.
o Complete triage of injured passengers and crew and transport to hospital.
o Conduct joint agency SAR efforts.
o Conduct Urban Search and Rescue.
o Account for and provide temporary shelter for displaced passengers and crew.
o Complete accountability for all passengers and crew.

Fire/Salvage:
o Commence fire fighting operations and contain, extinguish and overhaul fire.
o Conduct damage/stability assessment; develop and implement a salvage plan.
o Implement the salvage and tow plan.

Port, Waterways, and Coastal Security/Law Enforcement:
o Implement security awareness measures including evaluation of changes in incident effects, response conditions, and secondary threats, including potential targeting of first responders and contamination.
o Implement measures to isolate, contain and stabilize the incident, including establishment and adjustment of security perimeters.
o Implement agency and maritime community security plans, including Area Maritime Security Plans (AMSP), to deter and prevent multiple security incidents.
o Establish incident security plan including identification badges and other scene control measures.
o Implement scene integrity and evidence preservation procedures.
o Implement procedures that ensure a coordinated effort is in place for investigation, evidence collection, storage and disposal.
o Investigate cause of incident.
o Identify and implement witness/passenger recovery location(s).
o Establish incident security plan including access documentation (e.g. badge control procedures) and other access control measures.
o Establish and continue enforcement of safety/ security zones.
o Establish/conduct shoreline security to coincide with incident activities and enhanced prevention requirements.
o Perform maritime law enforcement as required.
o Request FAA Implement air space closure and monitoring for compliance.

Waterways Management:
o Conduct port assessment and establish priorities for facilitating commerce.
o Develop/implement transit plan to include final destination/berth for vessel(s).
o Identify safe refuge/berth for impacted vessels.
o Establish and maintain close coordination for possible movement of Homeland or National Security assets (Navy).

Oil/HAZMAT Spills:
o Initiate actions to control the source and minimize the volume released.
o Determine oil/hazmat fate and effect (trajectories) identify sensitive areas, develop strategies for protection and conduct pre-impact shoreline debris removal.
o Contain and recover spilled material (Oil/Hazmat).
o Conduct an assessment and initiate shoreline cleanup efforts.
o Remove product from impacted areas.
o Conduct efforts to effectively contain, clean up, recover and dispose of spilled product.

Environmental:
o Provide protection of environmental sensitive areas including wildlife and historic properties.
o Identify and maximize the protection of environmental sensitive areas.
o Identify threatened species and prepare to recover and rehabilitate injured wildlife.
o Investigate the potential for and if feasible, utilize alternative technologies to support response efforts.

Management:
o Manage a coordinated interagency response effort that reflects the makeup of Unified Command.
o Establish an appropriate IMT organization that can effectively meet the initial and long term challenges required to mitigate the incident.
o Identify all appropriate agency/organization mandates, practices, and protocols for inclusion in the overall response effort.
o Identify and minimize social, political and economic adverse effects.
o Implement a coordinated response with law enforcement and other responding agencies including EOC(s) and the JFO.
o Evaluate all planned actions to determine potential impacts on social, political and economic entities.
o Identify competing response activities (LE and Mitigation) to ensure that they are closely coordinated.
o Identify and establish incident support facilities to support interagency response efforts.
o Keep the public, stakeholders and the media informed of response activities.
o Ensure appropriate financial accounting practices are established and adhered to.
o Establish internal/external resource ordering procedures are established and adhered to.
o Establish an incident documentation system.
o Establish an appropriate structure to facilitate communications with stakeholders and agency/organization coordination facilities.

Example Tasks/Work Assignments:
Incident Management Team members expect Command to assign them specific tasks based on the unique characteristics of an incident. Common tasks that are normally performed by the staff during responses should not be addressed as tasks. The Operations Section Chief normally receives tasks (work assignments) from Command in the form of incident objectives. Some examples of common tasks (work assignments):

Safety Officer:
o Develop a site safety plan, including support facilities and monitor for compliance.
o Report any serious incidents, accidents, or injuries immediately to command.
o Work closely with Logistics to ensure that appropriate communications are in place to support the response effort.

Public Information Officer:
o Develop a media strategy, Review strategy with Command prior to implementation.
o Establish contact with other Public Information personnel.
o Locate and establish a JIC.
o Provide talking points to Command for press briefings, VIP visits and town hall meetings.
o Keep Command informed of any potential adverse political, social, and economic impacts.

Liaison Officer:
o Develop an action plan to ensure communication and coordination with appropriate stakeholders and submit draft of plan to Command for review and approval.
o Keep Command informed of any stakeholder adverse feelings/relationships that may develop.

Intelligence Officer:
o Identify critical intelligence needs and develop intelligence flow plan and brief IMT.
o Ensure that all requests for information (RFI's) are sent and the Command is briefed on all Field Intelligence Reports (FIR).
o Be central point of coordination for all interagency intelligence organizations: Field Intelligence Support Teams, Joint Terrorism Task Forces, Intelligence Fusion Centers, etc.
o Screen intelligence information for OPSEC/Security Sensitive Information (SSI) classification.
Planning:
o Ensure that all off-site information reporting is approved by Command prior to release.
o Develop a contingency plan for sustaining long-term IMT staffing.
o Brief IMT staff on document control system, including handling and storing secure documents.
o Provide all documents that need review or approval by Command at least one hour prior to implementation or release.

Finance/Admin:
o Provide Command with a summary daily cost estimate.
o Establish a claims system and brief the IMT on the process.
o Advise Command of unusual high cost specialized equipment use.

Logistics:
o Develop and brief the IMT on the internal/external resource ordering process and monitor for compliance.
o Ensure that appropriate security is established at each incident support facility.
o Develop a plan; establish secure communication for both internal and external use and brief IMT staff.