Development of a pre-scripted Incident Action Plan for tornado incidents

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Abstract

The Village of Bolingbrook (VOB) is located just outside of Chicago, Illinois an area known for severe weather including tornado incidents. The problem is the Bolingbrook Fire Department (BFD) does not have a pre-scripted Incident Action Plan (IAP) to follow when the VOB is stricken with a tornado. The purpose of the applied research project (ARP) is to develop a pre-scripted IAP to guide the fire department shift commander during the initial sixty minutes of a tornado striking the VOB. The research questions were the following: a) What are the anticipated issues a fire department will encounter during the initial sixty minutes of a tornado incident; b) What are the objectives of the pre-scripted Incident Action Plan; c) What resources are needed during the initial sixty minutes of a tornado incident; d) What guidelines or plans have been developed by other fire departments to address a tornado incident. The researcher used action research with procedures involving a literature review of prior incidents, interviewing those involved in prior tornado incidents and reviewing a draft pre-scripted IAP with the three BFD shift commanders. The results identified eight objectives including establishing unified command, identification of three suggested staging areas, outlining the operational emphasis for fire, police and public works departments in the VOB, and three general situational awareness messages. A pre-scripted IAP was developed utilizing a standard Federal Emergency Management Agency (FEMA) Incident Command System (ICS) form 202. The recommendations included review and implementation from the BFD Deputy Chief and the VOB Public Safety Director. Once approved, education and implementation of all officers within the BFD will be completed. Long term recommendation is to conduct a post incident review when the pre-scripted IAP is used in the VOB or in a neighboring community.

Table of Contents

Abstract……..3

Table of Contents……...4

Introduction……5

Background and Significance…….5

Literature Review……7

Procedures……..14

Results……17

Discussion……...22

Recommendations……...25

References……...27

Appendix A…….30

Appendix B…….31

Appendix C…….33

Appendix D…….34

Appendix E……..35

Appendix F……..36

Appendix G……..37

Appendix H……..39

Introduction

The Village of Bolingbrook (VOB), a community of fifty years this 2015, is located approximately 30 miles southwest of Chicago, Illinois, has a population of 74,000 people and is approximately 24 square miles (Village of Bolingbrook, 2014). The VOB has approximately 23,000 residential units with critical infrastructure that includes a five story hospital with over 200 beds (USA City Facts, 2013). Bolingbrook, like many communities in Illinois, is prone to severe weather including the possibility of tornados.

The problem is the Bolingbrook Fire Department (BFD) does not have a pre-scripted Incident Action Plan (IAP) to follow when the VOB is stricken with a tornado. The purpose of this Applied Research Project (ARP) is to develop a pre-scripted IAP to guide the fire department shift commander during the initial sixty minutes of a tornado striking the VOB. This study will identify through action research: a) What are the anticipated issues a fire department will encounter during the initial sixty minutes of a tornado incident b) What are the objectives of the pre-scripted Incident Action Plan. c) What resources are needed during the initial sixty minutes of a tornado incident d) What guidelines or plans have been developed by other fire departments to address a tornado incident. This research developed a pre-scripted IAP which is located in the appendix.

Background and Significance

The VOB is no stranger to severe weather including possible tornado incidents. Each year on average two to three times, the emergency dispatch center activates the outdoor warning sirens. Sirens are activated to warn citizens based on the criteria including a tornado is either visualized in the area or it is suspected that high winds over fifty miles per hour is causing

structural damage, or the National Weather Service (NWS) has issued a warning for the VOB to be in a direct path of a tornado (*Severe Weather Protocol*, 2014). In the year 2008, the VOB experienced an F1 tornado incident, causing damage to approximately four homes and in 1990 an F5 tornado struck the community of Plainfield directly west of the VOB (Home Facts, 2015). Each year, according to the Illinois Emergency Management Agency (IEMA), Illinois averages forty seven tornados and the year 2013 went above the average with a reported fifty four tornados resulting in eight fatalities (Illinois Emergency Management Agency [IEMA], 2014, p. 1).

The BFD is comprised of five fire stations that are all supervised by one shift commander. The shift commander is a Battalion Chief and in his absence replaced with a Lieutenant. Chief Officers of the command staff are available immediately during normal business hours; however there could be a delay after regular business hours and on weekends for supporting the on duty shift commander with emergencies including tornados. Shift commanders incident command experiences are usually responses for structure fires, fire alarms, gas leaks and complex vehicle accidents (Bolingbrook Fire Department [BFD], 2013). Tornado incidents are infrequent and are considered by the researcher to be a high risk/low frequency event.

This ARP developed a pre-scripted IAP which identifies the objectives for the first sixty minutes of a tornado incident. The pre-scripted IAP will identify the responsibilities for the fire department shift commander and give a checklist type sheet they can utilize which includes the recommendation to implement a unified command with representatives from police and public works departments. Implementation of this pre-scripted IAP during a tornado incident will

increase the probability that important tasks are addressed and lead to a more organized command structure. As Chief McQueary of Athens, Texas fire Department suggested the analogy of using a checklist for launching a boat will hopefully prevent you from not forgetting to put the plug in the bottom and sinking your boat (J. McQueary, personal communication, January 7, 2015).

The significance of this research is related to the goal from the National Fire Academy (NFA) Executive Analysis of Fire Service Operations in Emergency Management (EAFSOEM) class as it "prepares senior fire officers in the administrative functions necessary to manage the operational component of a fire department effectively"(United States Fire Administration [USFA], 2014, p. I-8). It correlates with the United States Fire Administration (USFA) operational objectives two and three: "improve local planning and preparedness" and "improve the fire and emergency services 'capability for response to and recovery from all hazards" (United States Fire Administration [USFA], 2010, p.13).

Literature Review

Tornados are described and evaluated differently than weather storms such as snow and hurricanes as those usually have predictable outcomes. Tornados, according to journalist Marq De Villiers, are categorized "after the fact, by the damage they have caused" (Villiers, 2008, p. 211). Tornados are usually described as funnel shaped and are known to not follow predictable paths by skipping and jumping which produce situations where houses next to each other having varying degrees of damage including total collapse of one and the other having minimal or no damage (Walker, 2011).

The damage caused by tornados is evaluated on a scale called the Fujita Scale. It rates them from the least damaging F1 through the most damaging F5. This scale was developed from the University of Chicago (U of C) by Allen Pearson and Theodore Fujita. In the early 1970's, Pearson was a director with the National Storm Forecast Center and Fujiti a researcher with U of C (Villiers, 2008). Today, researchers now developed what they call the "Enhanced Fujitas Scale" and the National Oceanic and Atmospheric Administration (NOAA) utilizes that scale to rate tornado's which still categorizes them with levels of F1 through F5 (Koppes, 2011).

According to a technical report from the United States Fire Administration (USFA), there are on average eighty deaths and fifteen hundred injuries reported annually from the one thousand tornados occurring in the United States (Stambaugh & Sensenig, 2008). This report identifies the months of March through September being the most predominant time period and that technology such as Doppler radar has helped forecasters identify the possible paths of tornados. Residential areas being damaged causing the likelihood of injuries, tornado paths crossing jurisdictional lines and knowing mutual aid agreements are challenged are some issues fire departments need to be cognizant. However, the report suggests that "one of the first tasks confronting a fire department following a tornado should be to determine the status of its members and equipment" (Stambaugh & Sensenig, 2008, p. 27).

The Los Angeles Fire Department adopted a policy titled the 'Earthquake Emergency Mode" for procedures to follow after certain levels of an earthquake. The USFA technical report suggest that an earthquake or "other no-notice event such as a tornado, fire department safety personnel should asses viability of their stations" (Stambaugh & Sensenig, 2008, p. 16) The Los Angeles policy follows this by having the first thing crews do is check their stations, personnel

and apparatus for any injuries or damage. In the 1994 Northridge Earthquake, one of the battalions with eight stations had varying forms of damage.

In September of 1999, the city of Mesa, Arizona was stricken with not a tornado, but a weather wind emergency called a "microburst" and had winds over ninety miles per hour. According to the NOAA, microbursts can be very dangerous and have comparable damage levels to tornados (National Oceanic and Atmospheric Administration website, n.d.). This particular storm in Mesa produced damage over a nine-square mile radius with three square miles being the hardest hit. Their initial strategy was to "identify urgent service needs such as gas leaks, fires, serious injuries and trapped victims" (Cameli, 2000, p. 128). In December of 2000, Tuscaloosa, Alabama area suffered an F4 tornado and it was noted that the incident management systems worked, however a lesson learned was to establish a staging officer and to consider distancing the incident command from the incident (Garlock, 2001). In the Mesa microburst incident, they too had an issue with the command post being close to evacuation areas, staging and the media. Mesa officials identified in their lessons learned that additional command staff was needed earlier rather than later (Cameli, 2000).

Fire departments should anticipate the need for multiple agencies due to issues such as blocked roadways from trees and abandoned vehicles. According to the USFA technical report, "the best way to coordinate multiple agencies is through a unified command structure" (Stambaugh & Sensenig, 2008, p. 17). In May 2011, Joplin, Missouri suffered a tornado incident that was rated at F4 and F5 levels as it caused damage over six miles long (Federal Emergency Management Agency [FEMA], 2011). Mike Walker with the website Firefighter Nation suggests the idea to give consideration, based on the needs of the situation, to establishing

a unified command in tornado situations (Walker, 2011). Salvatore Scarpa with his research with tornado incident planning objectives in his EFO project, suggests unified command early as a command consideration and to make it "strong, direct and visible"(Scarpa, 2008, p. 56).

The International Fire Service Training Association (IFSTA) identifies unified command as essential and the "key to the success of any multiagency emergency incident" (Chief Officer, 2004, p. 406). In the Joplin incident, Joplin officials reported that the large amount of mutual aid was good, however it challenged them. The challenge was self-dispatching by various first responder agencies and that they "began performing tasks without coordinating with local incident command" (FEMA, 2011, p. 15). The report also indicated that search efforts were challenged and slowed by crews using various search markings on buildings and by personnel not checking in with command.

Tornados are considered natural disasters and as is reported in the USFA technical report, it has needs such as multiagency cooperation and local officials should be cognizant they will be beyond local political boundaries. It is suggested that unified command would be appropriate for tornado incidents and unified command can be defined as:

> An application of ICS used when more than one agency has incident jurisdiction or when incidents cross political jurisdictions. Agencies work together through the designated member of the Unified Command, often the senior person from agencies and/or disciplines participating in the Unified Command, to establish a common set of objectives and a single Incident Action Plan (Stambaugh & Sensenig, 2008, p. 29)

The initial stages of the tornado incident will be based on rescue and life safety; however it will eventually shift to a recovery operation. The technical report suggests that "the leadership of the

unified command may shift from fire/EMS to law enforcement or other agency like public works that has a mission to complete" (Stambaugh & Sensenig, 2008, p. 29).

The IFSTA Chief Officer handbook identifies the unified command structures as promoting safety, increasing effectiveness and that it will enhance the professional image. The handbook recognizes that "humans cannot prevent many of these disasters but the effects can be controlled" ("Chief Officer," 2004, p. 415). It recommends that written IAP's be developed for situations involving multiagency and multijurisdictional. The National Fire Protection Agency (NFPA) identifies pre-incident planning with protecting property, the environment, emergency personnel and that it will help manage emergencies effectively (National Fire Protection Association [NFPA], 2010).

The NFPA suggests that pre-incident planning can be detailed or generalized with data developed by an incident commander. The plan should also be "reflecting the overall incident strategy, tactics, risk management and member safety" (NFPA, 2010, p. 1620-6). Consideration should be to assure that consensus among those who will be using the pre-incident plan has been completed and those individuals are good with the data and objectives. The NFPA recommends that it is "helpful to understand the intended audience for the pre-incident plan" (NFPA, 2010, p. 1620-14). FEMA developed a guideline for incident action planning. In the guidebook they recommend safety messages and objectives be listed by priority on a standard form called the FEMA-ICS 202 form (Federal Emergency Management Agency [FEMA], 2012).

Christopher Carver, a public safety communications professional, suggests that tornados and other storm responses should not be surprising for fire departments and those departments can be successful because departments can and should plan ahead (Carver, 2012). Carver

suggests that success in tornado situations is expected from the public and that departments should not be overwhelmed. He stated that measuring success in regards to planning is "not whether you followed the plan to the letter, but whether you managed the disasters initial phase or golden hour effectively" (Carver, 2012, p. 2). Mike Walker with firefighter nation, expounds on that same topic suggesting that the tornado incident can be remembered by the way the response was handled and if or if not it had met expectations of the public (Walker, 2011).

Walker in his article recommends departments consider a "building triage" prior to the event by noting the various types of structures and the typical damage to be expected. His opinion is that wood frame structures are the most vulnerable. He too recommends consideration be given to implementing a unified command structure and that the central command post location will accommodate workspace and good communications (Walker, 2011).

In her research with the Naval Postgraduate School, Cynthia Renaud looked into how, why and when people in chaotic situations make decisions. Her research found that National Incident Management System (NIMS) training was standard in emergency services and preparation for chaotic events, however she suggests that "it takes a certain kind of person to function" and that the initial actions will later determine the outcomes to be either successful or possibly failure (Renaud, 2010). Her thesis argument is that not all people can be an incident commander because they have NIMS training and that they are born with good skills but made better with the NIMS training. She does however recommend checklists provided with NIMS training and suggests that they can be "indispensable to ordering elements and units to avoid duplication, maintain consistent tracking, and create a communication environment" (Renaud, 2010, p. 52). Renaud looks at these checklists as questions an incident commander can and

should ask of themselves in the initial stages of a chaotic situation. She recommends the following three questions: "What do I want to do? What do I have to do? What can I do?" (Renaud, 2010, p. 77).

Perhaps the checklists and objectives all flow into what a recent firefighter nation article suggested as the analogy of a sports game on television. In the article Ready for Anything, the authors reference the use of an IAP as "displaying" the score of a game on the screen and that the IAP "doesn't tell us how to coach the team or the best course of action" (Don & Brett, 2009, p. 2). They suggest that the IAP is situational and that it should not give away your authority or command. Renaud in her research suggest that incident commanders orders are "starting points" and that there should be the realization that orders could be "magnified by additional responders eager to take on any task that might contribute to the successful conclusion of the event" (Renaud, 2010, p. 46). She summarizes the topic of chaos and first responders with the suggestion that the "barometer for success is not whether they can immediately end the chaos, but rather, how quickly and effectively they can manipulate all elements and work through it" (Renaud, 2010, p. 94).

In summary, the literature review focused on the topics of tornados, planning, incident planning, unified command, NIMS and disaster planning. The researcher focused on these subjects which helped with writing questions for the phone interviews. The challenges other departments had were noted and assisted the researcher with developing safety messages and some of the objectives in the pre-scripted IAP.

Procedures

The ARP was formatted and written utilizing the American Psychological Association publication manual sixth edition. The researcher completed action research to answer and identify what are the anticipated issues a fire department will encounter during the initial sixty minutes of a tornado event, what are the objectives of the pre-scripted IAP, what resources are needed during the initial sixty minutes of a tornado event and what guidelines or policies have been developed by other fire departments addressing the initial sixty minutes of a tornado event.

Initial research began in August 2014 while the researcher was on campus at the National Emergency Training Center (NETC) attending the year three Executive Fire Officer (EFO) class. The Learning Resource Center (LRC) was utilized by researching dissertations and thesis on the subject of disaster planning and disaster response. EFO applied research projects from prior students were researched on the topics of decision making, damage assessment, emergency response and in the subcategory for the third year course EAFSOEM. While at the NETC, the researcher was given a contact from one instructor of a chief who had been an incident commander for a tornado incident in Texas back in the year 2000. The researcher continued with research at the Fountaindale Library in Bolingbrook, Illinois by utilizing related topics for journals and books. The search engine www.google.com was also utilized for topics such as tornado, pre planning and disaster planning.

The researcher discussed the ARP topic with chiefs while attending area chief meetings and was given ideas on who to contact for phone interviews. Five phone interviews were first established via electronic mail asking these individuals if they would be able to assist with answering questions to develop a pre-scripted IAP. All five agreed and were given the series of

questions to review prior to the phone interviews so that they could prepare in advance (Appendix A).

The NFPA recommends when preparing pre-plans to engage and gather data from reliable knowledgeable people and that is why the researcher had selected them for phone interviews (NFPA, 2010, p. 1620-7). The researcher chose interviews with these reliable and knowledgeable individuals because of the researcher's prior positive experience with the 2013 ARP for Development of a pre-scripted IAP for road closures (Ross, 2013). Four of the five interviewees had been involved in the initial sixty minutes of a tornado or severe wind incident. The fifth interviewee was chosen for his experience with tornado incidents after the initial sixty minutes and is affiliated with emergency management. The phone interviews were conducted over a period of two weeks in January 2015 and were approximately thirty minutes in duration.

The first phone interview was with Chief McQueary on January 7, 2015 while the researcher was in his office. Chief McQueary was the incident commander for a tornado incident in March 2000 (Appendix B). The second phone interview was with retired Assistant Chief Mierop on January 14, 2015 while the researcher was in his office. Chief Mierop was the incident commander of a tornado incident in August 2008 (Appendix C). The third phone interview was with Battalion Chief Beyer on January 14, 2015 while the researcher was in his office. Chief Beyer was the incident commander of a tornado incident in June 2011 (Appendix D). The fourth phone interview was with Mr. Adler on January 14, 2015 while the researcher was in his office. Mr. Adler is a coordinator for emergency management and has been involved with tornado incidents after the initial sixty minutes (Appendix E). The fifth phone interview was with retired Chief Eichelberger on January 20, 2015 while the researcher was in his office.

Chief Eichelberger was the initial incident commander for an F5 tornado incident in August 1990 (Appendix F).

Each of the interviewees was given the same sample questions to review prior to the phone interview. These questions assisted the researcher in developing the draft pre-scripted IAP by identifying challenging issues, anticipating issues, needed resources, the severity of the tornado incident and if the department had a pre-scripted IAP the day of the tornado and if they have one today. After each phone interview, the researcher electronically mailed the interviewee the questions and answers for them to review. All of the interviewees acknowledged receipt of the electronic mail attachment with answers from the phone interview and requested no changes or clarification.

A request was made through the assistance of the NFA Training Resources and Data Exchange (TRADE) program on January 15, 2015. This website assists fire service personnel with the ability to share ideas, data, procedures and plans (United States Fire Administration, n.d.). The request asked those recipients to share with the researcher a copy of their guideline or pre-scripted IAP for tornado incidents. After one week and not receiving any feedback from TRADE recipients, the researcher sent out one more request on January 26, 2015 through TRADE for information sharing. There were no responses from the TRADE request so the researcher then developed a draft pre-scripted IAP based on the phone interviews and the literature review. The lack of responses to the researchers TRADE requests was noted as a limitation during the project.

The draft pre-scripted IAP was electronically mailed on February 2, 2015 to the three shift commander Battalion Chief officers who manage the respective three shifts and five fire

stations of personnel for the BFD. These individuals will likely be first to arrive to a tornado incident. The researcher asked them to review the information in the document and to prepare for a brief meeting with the researcher. The purpose of the meeting was to explain the reasoning for the draft pre-scripted IAP, how it was developed including the suggested three staging areas and for them to provide feedback. The researcher conducted meetings with each of the shift commander Battalions Chiefs individually in the researchers' office on February 3, 2015, February 4, 2015, and February 5, 2015 to accommodate their work schedules.

Results

The phone interview with Chief McQueary discovered that his response in Arlington, Texas as incident commander was to a F4 tornado in the year 2000. His experience that particular day suggests that fire departments consider calling for resources including police for security, utility companies for power lines and gas leaks, and to and anticipate radio communication being hampered for various reasons. His current department has a standard operating procedure issued in June 2010 which details the priorities for a tornado incident as being life safety, incident stabilization and property conservation. His suggestion twice during the interview and described by him as "the most crucial objective" was setting up a perimeter specific to the damage area. He suggested utilizing terms such as hot, warm and cold be used based on levels of damage (J. McQueary, personal communication, January 7, 2015). The details for all his answers are available in Appendix B.

The phone interview with BFD Retired Assistant Chief Mierop noted that he was the incident commander for an F1 tornado in the year 2008. His experience illustrated high volume of calls for service that lead to difficult radio communications and recommended the need for

additional resources based on the needs. He felt it was important to first identify the damage area prior to calling in the resources and for response personnel to understand that initially they will need to have an attitude of “on your own”. He recommended a resource being the Will County Emergency Management Agency (EMA) to assist with personnel and a mobile command vehicle (R. Mierop, personal communication, January 14, 2015). Details for all his answers are available in Appendix C.

The phone interview with Battalion Chief Matt Beyer was a description of his command experience from a F1 tornado incident in 2011 that primarily did damage to trees. Battalion Chief Beyer described the winds being above residential roof lines that primarily damaged trees resulting in them falling over onto roadways. Surprisingly, his department received only one emergency call for service related to the tornado which resulted in no assistance needed from the fire department. His take from his F1 tornado experience was the need for public works to assist with roads and to consider calling internal and external fire department resources. The priorities can be assigned after the initial damage is assessed was his main recommendation (M. Beyer, personal communication, January 14, 2015). The details for all his answers are available in Appendix D.

The phone interview with Mr. David Adler, DuPage County Office of Homeland Security and Emergency Management (OHSEM) , allowed for the insight from a professional who has numerous experiences with tornado incidents. His experiences were after the initial sixty minutes which was different than the other four interviewees. His suggestions for fire department incident commanders are to identify the magnitude and size of the incident including identification of any critical infrastructure such as hospitals. He recommended requesting

additional resources, such as fire department command staff and emergency medical resources. In regards to rescue operations, he noted that it was a general guideline for rescue operations to be broken down to only ten percent needing heavy or special rescue team level resources. The majority of rescues were statistically at eighty percent being surface rescues performed by civilians and not the fire department. (D. Adler, personal communication, January 14, 2015). The details for all his answers are available in Appendix E.

The last phone interview was with Retired Chief Eichelberger who was the incident commander for a tornado incident in his community rated at an F5 in the year 1990. That community shares borders with the VOB and the BFD assisted on that particular August day. Chief Eichelberger shared his challenges that particular day being roads blocked, loss of water pressure and the need for natural gas and electrical crews. Mutual aid ambulances were unable to respond into the designated staging area because they were inadvertently stopped at various locations by citizens and other first responders requesting their assistance. That community did not have a pre-scripted IAP, but today they have their apparatus equipped with materials to assist with damage assessment. The lessons learned from that day in 1990, was outlined in a one page twenty point bulletin developed shortly after the incident by Chief Eichelberger with suggestions for future tornado incidents. (J. Eichelberger, personal communication, January 20, 2015). All the details of his phone interview are available in Appendix F.

To answer question one of the ARP "What are the anticipated issues a fire department will encounter during the initial sixty minutes of a tornado incident", the researcher noted the following issues through the five phone interviews: establishing a perimeter including identification of a zone concept, identification of critical infrastructure, notifying hospitals,

assigning resources into heavily damaged areas, prioritizing needs after assessments, requesting additional resources including Will County EMA and backfilling local resources, anticipate spontaneous responders, anticipating utility concerns including electrical, natural gas and water, identification of staging area, possible need to activate and Emergency Operations Center (EOC), need for portable lighting, need for extinguishment of fires and roads being blocked by trees, debris and vehicles.

To answer question two of the ARP "What are the objectives of the pre-scripted IAP", the researcher utilized the FEMA ICS 202 form outlining from the phone interviews the following: ensure the safety of all fire, police and public works employees; conduct a roll call of all five fire stations and personnel status; establish a command post that is visible but distanced away from the impacted area of damage; establish a unified command within ten minutes of establishing a command post by requesting representatives from police and public works to report to the command post; begin to identify the perimeter of the damage area and specifically to identify if more than one area has been damaged; request utility representatives to report to the command post; establish a staging area for fire department mutual aid; and fire department resource requests based on needs including EMS, technical rescue, water tender, hazardous materials, command staff chiefs, mobile command unit and fire resources. All of these objectives are available in Appendix G and H.

To answer question three of the ARP "What resources are needed during the initial sixty minutes of a tornado incident the researcher identified through the five phone interviews the following resources based on potential needs and listed them on the objectives of the FEMA ICS 202 form which are: EMS; technical rescue; water tender; hazardous materials; command staff

personnel; mobile command vehicle and fire suppression resources. Representatives from departments including police, public works, and utility representatives including water, natural gas and electric need to be at the unified command post. This list of resources is identified under objectives four, six and eight in Appendix G.

To answer question four of the ARP "What guidelines or plans have been developed by other fire departments to address a tornado incident" the researcher discovered through his interviews and literature review that minimal plans have been developed and those that are revolve around activating an Emergency Operations Center (EOC). One interviewee advised that their plan was to develop a formal IAP and activate the EOC if a tornado incident occurred. One interviewee discussed and shared his after action point list that included twenty items to act on and consider but no formal guideline or plan. One interviewee with his current fire department developed a pre-scripted IAP specific for tornado incidents. Two requests by the researcher in a span of two weeks through TRADE, a website sharing site affiliated with the NFA, requesting members to share with the researcher any guidelines or plans they have resulted in no pre-scripted IAP or guideline for tornados.

The researcher had brief meetings separately with the three BFD shift commanders on February 3, 2015, February 4, 2015, and February 5, 2015 to review the draft pre-scripted IAP for tornados which included operational emphasis for the fire department, suggested staging areas for equipment and general situational awareness for all responders involved. These were developed after reviewing the literature review of departments who experienced prior tornado incidents and from the interviewees' responses during the phone interviews. During one of the meetings it was suggested to include the alarm level for hazardous materials in objective eight.

In another meeting there was a concern for what action should be taken if one of the suggested staging areas was impacted by a tornado. It was decided by both the researcher and the Battalion Chief that identification of a new location or to utilize one of the other suggested staging locations located in the pre-scripted IAP would be the best course of action if that were to occur. All three Battalion Chiefs agreed with the concept, need and implementation of the pre-scripted IAP.

Fire department emphasis will be life safety including search and transport of the severely injured, extinguishment of fires and identification of natural gas leaks. Police department emphasis will be perimeter control, identification and control of deceased civilians, security for the command post, media relations and traffic control. Public works emphasis will be clearing roads of large debris to allow for rescue vehicles access. The situational awareness were developed as the following: safety is the responsibility of all personnel and to anticipate large crowds of civilians wanting to help; be alert for natural gas leaks, live electrical power lines and partially collapsed structures; anticipate low or loss of water pressure in fire hydrants if pumps fail due to loss of power. A list of all these department specific emphasis is listed on the FEMA form ICS 202 in Appendix G.

Discussion

The researcher had zero returns from his request through the TRADE network requesting examples of pre-scripted IAP and or guidelines related to tornados. There was only one pre-scripted IAP noted from the five interviews. The researcher noted in his literature review a prior EFO research project researching tornado IAP's encouraged unified command to be "strong, direct and visible" and specifically early (Scarpa, 2008, p. 56). A majority of disaster planning

research seemed to focus upon opening an Emergency Operations Center (EOC), and not much detail on actions or guidelines for incident commanders in the early stages of a tornado incident. The researcher believes there is a need for guidance in the initial stages and the pre-scripted IAP should be of assistance to shift commander Battalion Chiefs of the BFD.

The researcher interviewed personnel who were directly involved in tornado incidents which helped guide and develop the draft pre-scripted IAP. The FEMA ICS form 202 was utilized outlining by grouping the common thread of recommendations and answers to the researcher's questions. Unified command, identifying the damage area and perimeter, anticipating the need for utility companies, staging the appropriate equipment in a well-defined area and being specific on your needs were many of the common threads of needs and anticipated issues. Additionally, the example of the Los Angeles Fire Department checking on their personnel and equipment as the first order of business during an earthquake gave the researcher the idea to implement that as objective two in the draft pre-scripted IAP (Stambaugh & Sensenig, 2008)

The thesis paper by Cynthia Renaud resonated with the researcher by understanding her research to note the importance that incident commanders are "starting points" and her recommendation to utilize checklists will help in the initial stages of a disaster and therefore the researcher decided to utilize a checklist type format on the ICS 202 form (Renaud, 2010, p. 46). Tornado incidents are infrequent and this checklist pre-scripted IAP will guide the incident commanders during the initial stages of this possibly chaotic incident. BFD shift commanders usual responses are guided by utilizing a standard command worksheet for structure fires, gas leaks, and motor vehicle accidents. This draft pre-scripted IAP was reviewed by the shift

commander Battalion Chiefs after the researcher developed it as they are the intended audience as they likely will be first on the scene of tornado incidents. The NFPA recommends knowing who your intended audience is (NFPA, 2010). The researcher found it to be a useful tool in prior research to allow for input from those who will be using the pre-scripted IAP (Ross, 2013).

It is the intention of the researcher to help the initial incident commander with decision making and hopefully not forget something critical. As Renaud stated in her research that the "barometer for success is not whether they can immediately end the chaos, but rather, how quickly and effectively they can manipulate all elements and work through it" (Renaud, 2010, p. 94). Or perhaps this pre-scripted IAP will avoid what Chief McQueary analogy of a boat is sinking because you forgot to put the plug in the boat and the reason you forgot was because you did not utilize a checklist (J. McQueary, personal communication, January 7, 2015).

The implications of not developing a pre-scripted IAP for tornados has the potential for incident commanders to become overwhelmed with information and decisions out of the normal thought process such as with the usual emergency responses of fire, gas leaks and automobile accident emergencies. If first responders are not guided there is the possibility of critically injured people not being identified and cared for; not knowing the magnitude, scope and areas of damage; and the possibility the resources both internal to the village such as fire, police and public works as well as external resources such as utility companies will not be readily available to help mitigate the incident. In essence, roadways could be blocked with debris not allowing the resources to gain access to the damaged areas, security of the scene could be hampered and damaged areas mitigation of gas leaks, electrical hazards and fires could be delayed if the pre-scripted IAP is not utilized because certain things could be missed and or forgotten.

Implementing the pre-scripted IAP will guide the first initial chief officer arriving on the tornado incident some guidance as to what he or she will need to do during the initial sixty minutes. Perhaps they can ask themselves the questions Cynthia Renaud found useful in her research as: "What do I want to do? What do I have to do? What can I do?" (Renaud, 2010, p. 77). There will be more efficient use of resources in the initial sixty minutes while awaiting the additional resources including chief officers if noted to be needed. The fire department will know early on what the status of their personnel and equipment is after conducting the roll call. The fire department will enhance their professional image by what Mike Walker suggested in his journal article that the expectations of the public were addressed and how the fire department positively handled the situation (Walker, 2011).

Recommendations

The ARP provides the research and development of a pre-scripted IAP for tornado incidents to guide the fire department shift commander during the initial sixty minutes. The researcher developed this by interviewing incident commanders involved in the initial sixty minutes of prior tornado incidents and from the literature review of prior incidents in the United States. The researcher has both short term and long term recommendations.

The short term recommendation will be the review and approval of the pre-scripted IAP from the BFD Deputy Chief. The Deputy Chief oversees the daily operations of the fire department. Once approved by the Deputy Chief, the VOB Public Safety Director should be briefed and await his approval for implementation. His approval is needed as the pre-scripted IAP has outlined the operational emphasis that involves three departments in the VOB including police and public works. If approved, the researcher recommends the police and public works

departments be briefed on the pre-scripted IAP by the Public Safety Director. Once approved and implementation recommended, the researcher intends to instruct all officers of the BFD on all components of the pre-scripted IAP.

The researchers' long term recommendation is to conduct a review described as a post incident review of the pre-scripted IAP after it is used the first time. This can be for an incident within the VOB, or if a chief officer utilizes the guideline while at the scene of a neighboring community. It is a common practice that chief officers respond to the neighboring communities to assist at extra alarm incidents including events such as tornados. It is also possible that a neighboring department may use this pre-scripted IAP with a few of their own local details as it is a common practice to share standard operating procedures, incident command worksheets and now this pre-scripted IAP for tornado incidents. The post incident review can identify if the staging areas were appropriate in distance, if the objectives were appropriate, if the resource requests were appropriate and if all of this could actually be attained within sixty minutes.

Implementation of these recommendations should ensure the BFD initial incident commander for a tornado has a basic plan to follow specific to tornados prior to the EOC possibly being located and opened. If the pre-scripted IAP is utilized, the researcher believes that the three VOB departments will know what is expected of them; specifically the fire department will have a more detailed game plan. The researcher believes that in the end the BFD and the VOB will be represented well, that the potentially chaotic situation will not be stopped, but rather guided to an outcome those citizens will know their responders handled successfully and professionally.

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Appendix A

Phone Interview Questions

1.) What were your roles and or involvement in the initial 60 minutes of the tornado incident that struck your community?

2.) What were the initial emergency response issues your organization had to address in the initial 60 minutes of the tornado incident?

3.) Do you recall any issues that challenged you, the Incident Commander, or your organization during the initial 60 minutes of the tornado incident?

4.) What resources do your recommend is needed during the initial 60 minutes of a tornado incident?

5.) What in your opinion should the initial fire department Incident Commander anticipates during the initial 60 minutes of a tornado incident? Specifically, can you suggest any objectives for the initial 60 minutes?

6.) Did your organization have a guideline or pre-incident IAP for tornado incidents that particular day the tornado struck your community? If so, was it helpful and was it used?

7.) Does your organization today have a guideline or pre-incident IAP for tornado incidents?

Appendix B

Phone interview with Athens, Texas Chief McQueary:
January 7, 2015

1.) **What were your roles and or involvement in the initial 60 minutes of the tornado incident that struck your community?**

- Incident Commander (Battalion Chief) for an F4 tornado that struck Arlington, Texas in 2000. First arriving Chief Officer.

2.) **What were the initial emergency response issues your organization had to address in the initial 60 minutes of the tornado incident?**

- Most crucial objective is to identify and set up a perimeter around damage areas. Specifically, recommends setting up hot, warm and cold zones similar to hazardous materials emergencies.
- Once hot zone established, recommend everything in hot zone is searched for victims.
- Calling for additional resources early and have staged.

3.) **Do you recall any issues that challenged you, the Incident Commander, or your organization during the initial 60 minutes of the tornado incident?**

- Radio communications were difficult for multiple reasons.
- Lack of cell phones due to cell towers damaged from loss of electricity.
- Roads blocked with power lines and trees.
- Power lines with presumed live power on cars with people trapped.
- Citizens not directly involved in incident trying to enter hot zone to check on relatives.

4.) **What resources do your recommend is needed during the initial 60 minutes of a tornado incident?**

- Request fire department resources that are not impacted from the same tornado incident as they will not be able to assist.
- Treat the incident immediately such as you would for target hazard emergencies such as fires at high-rises or hospitals.
- Police resources for security, perimeter control and media.
- Request utility companies such as natural gas and electric.

5.) **What in your opinion should the initial fire department Incident Commander anticipates during the initial 60 minutes of a tornado incident? Specifically, can you suggest any objectives for the initial 60 minutes?**

- Most critical is to establish a perimeter and specifically a hot zone.
- Identify any critical infrastructure in that hot zone and check on status.
- Assign resources into the hot zone.
- Establish an Operations Officer.

- Notify hospital of tornado incident and probability of possible large numbers of injured. Establish a medical group.
- Objective to help those in greatest risk such as in the hot zone and then help the largest amount of people that could be helped.

6.) **Did your organization have a guideline or pre-incident IAP for tornado incidents that particular day the tornado struck your community? If so, was it helpful and was it used?**
- No.

7.) **Does your organization today have a guideline or pre-incident IAP for tornado incidents?**
- Yes. Now is Chief of the Athens, Texas Fire Department and they have established an IAP for this fire department's response to tornados.
- Chief McQuery used the analogy that an IAP for tornado incidents is similar to having a checklist for launching a boat in the water. "If you don't have a checklist you could possibly forget to put the plug in the bottom of the boat".

Appendix C

Phone Interview with Retired Bolingbrook Assistant Chief Mierop:
January 14, 2015

1.) **What were your roles and or involvement in the initial 60 minutes of the tornado incident that struck your community?**
   - Incident Commander (Asst Chief) for F1 tornado incident in August 2008.

2.) **What were the initial emergency response issues your organization had to address in the initial 60 minutes of the tornado incident?**
   - Multiple 911 calls for various degrees of damage.
   - Mutual Aid delayed/unavailable due to storm damage in their jurisdictions
   - Establishing a Command Post

3.) **Do you recall any issues that challenged you, the Incident Commander, or your organization during the initial 60 minutes of the tornado incident?**
   - Communications on radio (too much radio traffic) due to numerous emergency calls being dispatched.

4.) **What resources do your recommend is needed during the initial 60 minutes of a tornado incident?**
   - Call back off duty personnel to provide additional manpower.
   - Call for mutual aid from departments not impacted from tornado
   - Need a liaison person with dispatch to screen calls.

5.) **What in your opinion should the initial fire department Incident Commander anticipates during the initial 60 minutes of a tornado incident? Specifically, can you suggest any objectives for the initial 60 minutes?**

   - Incident Commander and other fire personnel adapt an attitude of being "on your own" to handle emergencies usually handled with more people.
   - Identify the damage area to then prioritize needs.
   - Identify the needed search and rescue areas.
   - Anticipate hazards such as natural gas and electrical emergencies and request those resources to mitigate.
   - Contact Will County Emergency Management Agency (EMA) to respond.
   - Anticipate spontaneous responders. Utilize them to assist with damage assessment.

6.) **Did your organization have a guideline or pre-incident IAP for tornado incidents that particular day the tornado struck your community? If so, was it helpful and was it used?**
   - No. Just internal notification list.

7.) **Does your organization today have a guideline or pre-incident IAP for tornado incidents?**
   - No

Appendix D
Phone interview with Battalion Chief Beyer Downers Grove FD
January 14, 2015

1.) **What were your roles and or involvement in the initial 60 minutes of the tornado incident that struck your community?**
- Downers Grove, Illinois tornado (F1) incident June 2011
- Battalion Chief Shift Commander (Incident Commander)

2.) **What were the initial emergency response issues your organization had to address in the initial 60 minutes of the tornado incident?**
- Received only one emergency call for a rescue of a person trapped in house from downed tree. That incident downgraded due to false information as no citizens were trapped.

3.) **Do you recall any issues that challenged you, the Incident Commander, or your organization during the initial 60 minutes of the tornado incident?**
- Trees blocking roadways.
- Tornado never actually hit ground. Heavy damage to trees falling onto roadways,

4.) **What resources do your recommend is needed during the initial 60 minutes of a tornado incident?**
- Public Works resources for trees blocking roadways
- Consider fire department (mutual aid) resources from non- neighboring communities as you need to anticipate they have storm damage too and will not be able to respond.

5.) **What in your opinion should the initial fire department Incident Commander anticipates during the initial 60 minutes of a tornado incident? Specifically, can you suggest any objectives for the initial 60 minutes?**

- Identify and prioritize needs based on damage assessments.
- Identify staging area for fire resources.
- Backfill or increase alarm level to backfill manpower at fire stations.
- Activation of Emergency Operations Center
- Need for portable lighting based on time of day.

6.) **Did your organization have a guideline or pre-incident IAP for tornado incidents that particular day the tornado struck your community? If so, was it helpful and was it used?**
- No

7.) **Does your organization today have a guideline or pre-incident IAP for tornado incidents?**
- No. Plan is for formal IAP to be developed when EOC is activated.

Appendix E
Phone interview with Mr. Dave Adler DuPage County (OHSEM):
January 14, 2015

1.) **What were your roles and or involvement in the initial 60 minutes of the tornado incident that struck your community?**
- No particular role in the initial sixty minutes.
- As coordinator with OEM, has been on scenes at numerous tornado incidents after the initial sixty minutes.

2.) **What were the initial emergency response issues your organization had to address in the initial 60 minutes of the tornado incident?**
- Recommends establishing IC, staging area, size-up and request resources.

3.) **Do you recall any issues that challenged you, the Incident Commander, or your organization during the initial 60 minutes of the tornado incident?**
- IC needs to identify the "size" of the incident and the "scope" (magnitude) of the incident.
- Once above completed, IC needs to identify the target hazards and critical infrastructure damage inside the perimeter.

4.) **What resources do your recommend is needed during the initial 60 minutes of a tornado incident?**
- Additional Command Staff.
- Fire, rescue, hazardous materials and EMS resources.

5.) **What in your opinion should the initial fire department Incident Commander anticipates during the initial 60 minutes of a tornado incident? Specifically, can you suggest any objectives for the initial 60 minutes?**
- Establish the perimeter. Start rescue operations. As a general rule (10%) is heavy rescue team level, (10%) are fire crew level and (80%) are surface rescues usually conducted by civilians.
- Extinguish fires. Anticipate limited or no water.
- Identify and mitigate hazards (Natural Gas, Electric and Chlorine). Chlorine leaks will most likely be at water treatment plants.

6.) **Did your organization have a guideline or pre-incident IAP for tornado incidents that particular day the tornado struck your community? If so, was it helpful and was it used?**
- No

7.) **Does your organization today have a guideline or pre-incident IAP for tornado incidents?**
- No

Appendix F

Phone interview with retired Plainfield Chief Eichelberger:

January 20, 2015

1.) **What were your roles and or involvement in the initial 60 minutes of the tornado incident that struck your community?**
   - Plainfield F5 tornado in August 1990.
   - Chief was at downtown station at time of incident and became the IC.

2.) **What were the initial emergency response issues your organization had to address in the initial 60 minutes of the tornado incident?**
   - The ability to identify the scope and area of damage.
   - Initial Mutual Aid Chiefs were to report the Command Post but were immediately diverted to 5 different areas and established command posts.

3.) **Do you recall any issues that challenged you, the Incident Commander, or your organization during the initial 60 minutes of the tornado incident?**
   - No street signs or visible landmarks to give responders directions.
   - Flat tires due to debris in roadway.
   - Volunteers (non- fire personnel) self-dispatching wanting to help in various capacities but not reporting to areas assigned by command.
   - Blocked roads from trees, home and car debris.
   - Ambulances unable to respond into designated staging area because they were stopped by citizens requesting help.

4.) **What resources do your recommend is needed during the initial 60 minutes of a tornado incident?**
   - Consider mutual aid task forces and strike teams based on needs.
   - Public Works for road debris clearing.
   - Security issues assign to law enforcement.

5.) **What in your opinion should the initial fire department Incident Commander anticipates during the initial 60 minutes of a tornado incident? Specifically, can you suggest any objectives for the initial 60 minutes?**
   - Roads blocked.
   - Loss of water pressure due to water tower pumps losing electricity.
   - Need for utility companies (natural gas and electric) to respond.

6.) **Did your organization have a guideline or pre-incident IAP for tornado incidents that particular day the tornado struck your community? If so, was it helpful and was it used?**
   - No

7.) **Does your organization today have a guideline or pre-incident IAP for tornado incidents?**
   - No. However each engine is equipped with materials to conduct and initial damage assessment after a tornado incident.

Appendix G

INCIDENT OBJECTIVES (ICS 202)

1. Incident Name: Bolingbrook Tornado Emergency	2. Operational Period:	Date From: TBA Time From: Initial Time	Date To: TBA Time To: 60 Minutes

3. Objective(s):

1.)_____Ensure the safety of all Fire, Police and Public Works Employees.

2.)_____Conduct a Roll Call of all five fire stations and personnel status.

3.)_____Establish a "COMMAND POST" that is visible but distanced away from the impacted area of damage.

4.)_____Establish a "UNIFIED COMMAND" within 10 minutes of establishing a Command Post. Request via dispatch a representative from Police and Public Works to report to the Command Post.

5.)_____Begin to identify the "Perimeter" of the damage area. Specifically; identify if there are one or multiple areas of "severe" damage.

6.)_____ Request utilities representatives (Gas, Water and Electric) to report to the Command Post .

7.)_____Establish a "STAGING AREA" for fire department mutual aid prior to requesting additional alarm levels. Consideration should be given to establishing a staging area away from damage area. Possible locations (see map attachment) are:

East: Promenade Mall Parking Lot (Boughton Rd / I-355)
Central: Holiday Inn Hotel Parking Lot (Rt53/ I-55).
West: Lowes Hardware Parking Lot (Weber Rd / Veterans Pkwy)

8.) Fire Department Resource request based on needs:

_____EMS	City Wide	Box Alarm # EMS
_____Technical Rescue (rescue)	City Wide:	Box Alarm # TRT
_____Water Tender (no water in hydrants)	City Wide:	Box Alarm # TENDER
_____Hazardous Materials	City Wide:	Box Alarm # Haz Mat
_____Command Staff Chiefs	City Wide:	Plan #1
_____Mobile Command Vehicle	City Wide:	Will County EMA
_____FIRE:	East of Power Lines:	Box Alarm #1
	West of Power Lines:	Box Alarm #2

4. Operational Period Command Emphasis:

1.) Fire Department Emphasis will be the following: Life Safety including rescue of trapped civilians, transport of severely injured, extinguishment of fires and identification of natural gas leaks.

2.) Police Department Emphasis will be the following: Perimeter control of civilians, identification and control of deceased civilians, security for the command post, media (PIO) and traffic control.

3.) Public Works Emphasis will be the following: Clearing roads of large debris to allow for rescue vehicles. This could include small tools such as chainsaws and utilization of large machinery including plow trucks.

General Situational Awareness

1. Incident Name: Bolingbrook Tornado Emergency	**2. Operational Period:**	Date From: TBA Time From: Initial Time	Date To: TBA Time To: 60 Minutes

1.) Safety is the responsibility of all personnel. Anticipate large crowds of civilians wanting to help.

2.) Be alert for possible natural gas leaks, live electrical power lines and partially collapsed structures.

3.) Anticipate low or loss of water pressure in fire hydrants if pumps fail (loss of electricity).

5. Site Safety Plan Required? Yes ☐ No ☒
Approved Site Safety Plan(s) Located at: _____

6. Incident Action Plan (the items checked below are included in this Incident Action Plan)**:**

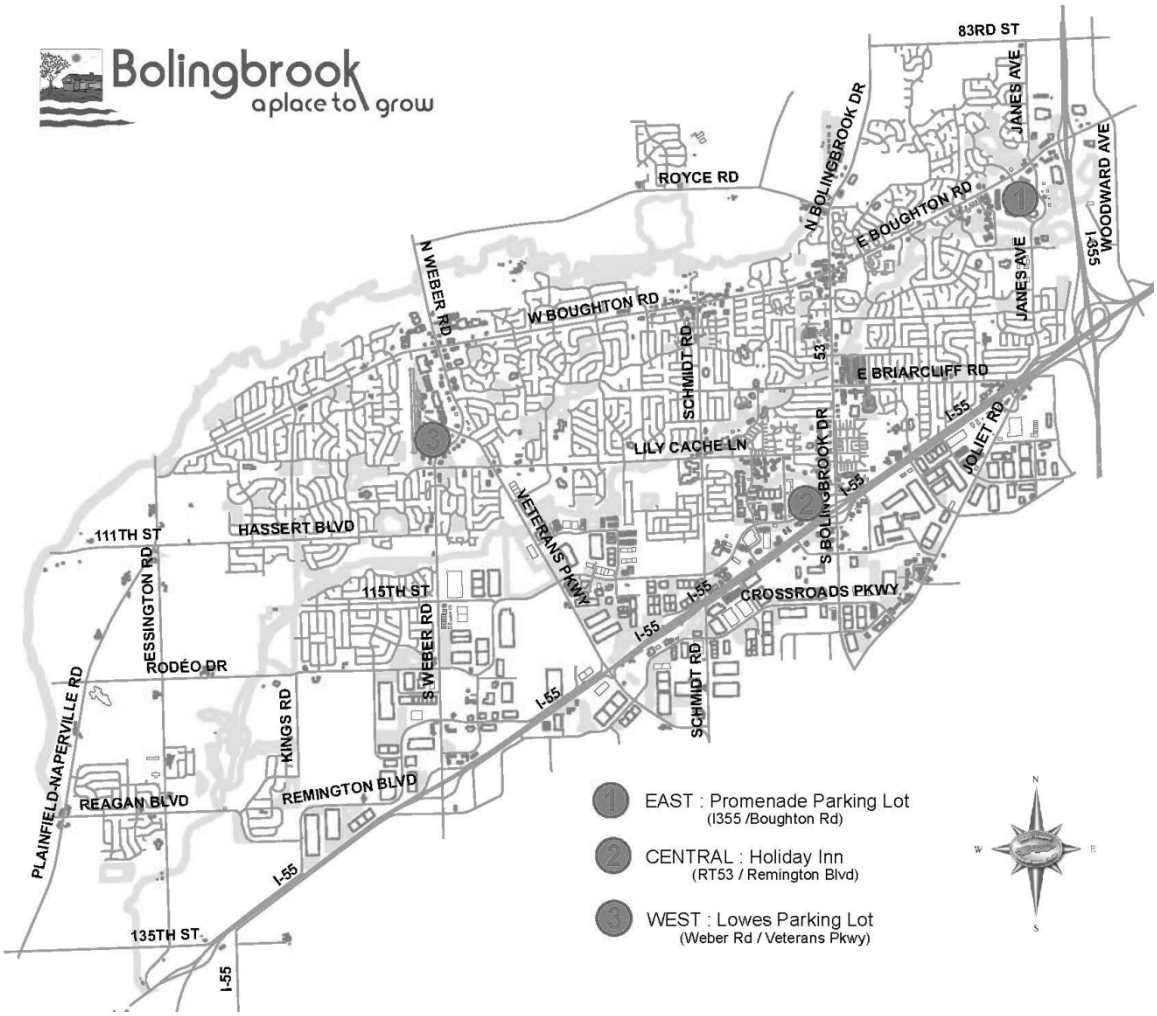
☐ ICS 203	☐ ICS 207	Other Attachments:
☐ ICS 204	☐ ICS 208	☐ _____
☐ ICS 205	☒ Map/Chart	☐ _____
☐ ICS 205A	☐ Weather Forecast/Tides/Currents	☐ _____
☐ ICS 206		☐ _____

7. Prepared by: Name: Daniel Ross(Fire) Position/Title: Battalion Chief Signature: _____

8. Approved by Incident Commander: Name: Signature: _____

ICS 202	**IAP Page**	Date/Time: Date

Appendix H


Bolingbrook
a place to grow
83RD ST
ROYCE RD
N BOLINGBROOK DR
JANES AVE
WOODWARD AVE
I-355
E BOUGHTON RD
N WEBER RD
W BOUGHTON RD
SCHMIDT RD
53
E BRIARCLIFF RD
I-55
JOLIET RD
LILY CACHE LN
S BOLINGBROOK DR
VETERANS PKWY
111TH ST
HASSERT BLVD
115TH ST
CROSSROADS PKWY
ESSINGTON RD
S WEBER RD
RODÉO DR
KINGS RD
PLAINFIELD-NAPERVILLE RD
REAGAN BLVD
REMINGTON BLVD
135TH ST
1 EAST : Promenade Parking Lot
(I355 /Boughton Rd)
2 CENTRAL : Holiday Inn
(RT53 / Remington Blvd)
3 WEST : Lowes Parking Lot
(Weber Rd / Veterans Pkwy)
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