Call Processing Time vs. on Scene Times for Northeast Communications Center and the Loveland-Symmes Fire Department

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A research project submitted to the Ohio Fire Executive Program

July 2012

CERTIFICATION STATEMENT

I hereby certify that the following statements are true:

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ABSTRACT

The problem addressed was the delay of delivery of critical emergency services provided by the Loveland Symmes Fire Department (LSFD) being subject to delay by current dispatch system of Northeast Communication Center (NECC). The purpose of this research was to examine the extent of which critical emergency services are being delayed by NECC dispatch system. Identification of key reasons for delays in notification, and to identify best practices to correct these problems. Research data was gathered through a descriptive research process that includes review of current published literature, in house Records Management System (RMS), and Computer Aided Dispatch (CAD) system data. Surveys of 30 area fire departments and surveys of the 5 communication centers that serve LSFD along with personal interviews of communication OIC's were conducted. Observation of the NECC was conducted to identify delays in call entry, unit response selection, interrogation of the call, and alerting units. Current Standard Operating Procedures (SOP) for NECC and of Hamilton, Warren, and Clermont County communications centers were reviewed and compared to NFPA standards. As a result of the research project, it is recommended that NECC establish and implement a consistent call-processing standard, conduct hands on training annually, and continue to examine the feasibility of an automated dispatch system.

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INTRODUCTION

The dispatching of emergency resources to an incident scene is a critical and integral part of an emergency service. A delay in the dispatching of emergency resources to a critical incident could have a significant negative impact on the incident outcome. To fully understand response times requires the evaluation of the time of call, turn out time, and travel time, each which affect the outcome of the emergency.

The problem is that Northeast Communication Center (NECC) has exceeded the call-processing criteria for National Fire Prevention Association (NFPA) 1221 *Standard for the Installation, Maintenance and Use of Emergency Communication System*. The LSFD has established an overall response time (en-route time – on-scene time) of 6 minutes for first unit on scene 90 % of the time (LSFD EOM 701.00). The LSFD has found through past quality assurance reviews that call-processing procedures for calls handled by NECC exceed NFPA1221, 6.4. Delays in receiving the 911 calls at NECC and then processing 911 calls add to response times that exceed NFPA 1710 *Standard for the Organization and Development of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments.* Response delays factor negatively into patient care and the mitigation of emergency calls, in addition to creating customer complaints.

Purpose of the Study

The problem this study will investigate is the NECC failure to meet established goals for 911 processing times for emergency medical service. The study will also examine the extent of emergency services being delayed by NECC, to identify factors for these reasons, and to lead to development of strategies for improving processing times of 9-1-1 calls.

Research Questions

The following questions will be answered by this descriptive research:

1. What are the nationally accepted standards for EMS call processing time?
2. What are the current call processing times?
3. What is the present response time performance for LSFD?
4. What factors affect NECC call-processing time?

BACKGROUND AND SIGNIFICANCE

The Loveland Symmes Fire Department (LSFD) is a combination department made up of career and part-time personnel located 15 miles northeast of Cincinnati, Ohio. LSFD is a not for profit, private fire company. LSFD has always been a private fire company and will remain private until the City of Loveland and Symmes Township deem necessary to go public; it remains private today due to the economy, collective bargaining, and retirement. The City of Loveland and Symmes Township are keeping the cost to their residents down by continuing to contract with a private fire company. The city is located in three (3) different counties, (Hamilton, Warren, and Clermont) in the southwestern part of Ohio. Symmes Township is located in the northeastern part of Hamilton County. LSFD provides multiple services to the community including fire suppression, EMS service and transport, public education for fire safety, and fire inspection on commercial properties along with other community events.

LSFD operates out of four (4) stations, covering 13.4 square miles, 4.7 sq. mi in the city and 8.7 sq mi in the township. The City of Loveland has a population of 12,364 (2010 US Census) and 2,558 people per square mile. Symmes Township has a population of 16,005 (2010 US Census), with 1,836 people per square mile. Daily staffing consists of twelve (12) firefighters working 48-hour shifts on-duty followed by 96 hours off-duty. LSFD operates four (4) ALS/EMS units, two (2) ladders, four (4) engines, one (1) rescue, and one (1) district chief/shift commander who respond on a first emergency first basis.

In 1998, as part of our commitment to maintain outstanding operations, LSFD earned EMS accreditation through the Commission on Accreditation of Ambulance Service (CAAS). The Commission on Accreditation of Ambulance Services (CAAS) was established to encourage and promote quality patient care in America's medical transportation system. CAAS is an

independent commission that established a comprehensive series of standards for the ambulance service industry. CAAS accreditation signifies that your service has met the gold standard determined by the ambulance industry to be essential in a modern emergency medical services provider. These standards often exceed those established by state or local regulations. The CAAS standards are designed to increase operational efficiency and clinical quality, while decreasing risk and liability to the organization. The process includes a comprehensive self-assessment and an independent external review of the EMS organization. This independent process provides verification to your Board of Directors, city council, township trustees, and others that quality care is provided to the community. This process is repeated on a four (4) year cycle. During the review process, CAAS reviews training records, EMS reports and times, and department policies and procedures.

Prior to 1999, the primary communication center for LSFD was Hamilton County Communications. LSFD could also be dispatched through Warren County and Clermont County communication centers. To accomplish this, all responding units had three (3) mobile radios. Personnel had to be trained in communicating on three separate radio networks. Confusion among personnel on emergency calls was common.

After a devastating tornado in April of 1999, the City of Loveland and Symmes Township investigated a partnership in communications. Rising costs and improved service were deciding factors in the creation of a jointly funded operation. NECC was established in October 1999 and began operations in the lower level of LSFD's headquarters station. The communication center is staffed with one (1) full-time dispatcher per 8-hour shift and one (1) part-time dispatcher per 8-hour shift. NECC is staffed with at least two dispatchers from 0700-0300 and one dispatcher from 0300-0700. An LSFD Deputy Chief manages NECC between the

hours of 0800-1700 Monday through Friday. In addition to providing dispatch services for LSFD, NECC provides police dispatching service for the Loveland Police Department and District 3 of the Hamilton County Sheriff's Department. In 2010, NECC received and processed 26,353 9-1-1 calls. 54.79% of those calls were for incidents in the City of Loveland and 45.21% of them were for calls in Symmes Township.

NECC is designated as an Associate Public Safety Answering Point (PSAP). This means that all 9-1-1 calls are answered by one of the three county communications centers (Hamilton, Clermont, and Warren) and subsequently transferred to NECC. In general, the call processing information that is gathered prior to the 9-1-1 calls being answered by NECC is limited to the caller's location and the nature of call. Once it is determined that the caller is located in the City of Loveland or Symmes Township they are transferred to NECC. For the purposes of our statistical review, LSFD calculates call-processing times from the time the call is answered by NECC until dispatch of emergency medical units occurs. This study will examine the impact in which NECC handles call processing times and emergency service response times and how failure to improve these areas may result in loss of accreditation from CAAS. A loss in accreditation could result in the loss of public trust and possibly loss of levy funding by taxpayers for not delivering the best service possible. Failure to improve these areas could also result in sub-standard emergency service care.

When citizens call 9-1-1, they are experiencing a problem they believe is an emergency and they expect a quick response. Many may not understand the true importance of a quick response or have given any thought to what a quick response is. What people want when they are experiencing an emergency is help, and they want that help quickly. Otherwise, they would not have called 9-1-1. But the real reason a quick response is so important for many emergencies

is that speed of action is directly linked to a positive outcome. For many it can mean the difference in life and death. The American Heart Association's (AHA) chain of survival describes early access to the EMS system as critical to the survival of cardiac arrest victims (Aleshire et al., 2004). It is common knowledge that brain damage starts to occur after four minutes without oxygen to the brain. According to AHA, the chain of survival illustrates the importance of time sensitive actions for victims of ventricular fibrillation, sudden cardiac arrest, and respiratory arrest. Early delivery of defibrillation (within 3-5 minutes of collapse) can produce survival rates as high as 75 percent. The effect on survival rates when EMS response exceeds 5 to 6 minutes is significant. Survival rates reduce by as much as 10 percent per minute without CPR for each minute defibrillation is delayed (American Heart Association, 2007). Ventricular fibrillation is an example of the importance of rapid response by emergency personnel. Many other medical calls such as: severe asthma, central gunshot wounds, traumatic shock or injury, foreign body airway obstruction, multiple pelvic fractures, pulmonary edema, anaphylaxis, obstetrical emergencies, respiratory distress, strokes, altered mental status, drug overdose and cardiac disorders require prompt response, evaluation, and treatment (Salvucci, 2004: Neely, Norton, and Schmidt, 2000). In these situations, seconds count.

LITERATURE REVIEW

The literature review for this project was initiated to identify turn out times within the Loveland Symmes Fire Department (LSFD), and the processing time of call, dispatch, and responders on scene times. The information obtained in this review of the literature used research from other emergency service providers on the priority of the time it takes to process a 9-1-1 call, dispatch the detail, and have responders arrive on scene. The literature review was conducted to gain insight into the research questions.

Almost 80% of America's fire departments provide prehospital medical care and transportation (IAFF 1997) with that number reaching 98% in Ohio providing emergency medical service (Ohio/Gov 2011). Fire service-based EMS systems are repeatedly faced with the uncomfortable dilemma of providing prompt and appropriate EMS response in the face of rising cost and increasing service demands. These trends above will continue, so it is essential that fire service-based EMS providers understand and effectively use modern emergency medical dispatch (EMD). (Cady, Clawson, Martin, and Sinclair, 1999).

According to Maher (1999), it has been well documented that EMD has an extremely positive influence on overall patient care because the care starts when a trained dispatcher answers a call for help. If the fire service is to continue to meet the challenges looming on the horizon, it must accept that a valid and effective EMD protocol, applied in an appropriate manner is a pivotal part of this system (Cady 1999).

Many communication centers send the closest available first responders and Advanced Life Support (ALS) paramedics on medical calls. This maximal response philosophy is claimed to give those in dire need the closest help immediately and ALS help as quickly as possible. In most incidents, however this is misguided (Cady 1999).

All medical calls received at NECC, are categorized as emergency or non-emergency with no delineation between life threatening and non-life threatening. A call received for chest pain would receive the same priority code as a call for received for a lacerated finger, which would result in dispatch of an EMS unit with no consideration of whether it is the last EMS unit available. There is no system in place to put non-life threatening calls in a waiting mode to ensure that EMS units are available for true-life threatening emergency.

Important components of the emergency dispatcher process are the call takers and dispatchers. According to Cady, "emergency dispatchers are the first, first responders." The dispatcher occupies an essential role in EMS, deciding who and how they respond. In systems where these decisions are made by trained dispatchers correctly using medically supported tools, responses are justified and resources are effectively managed. In systems where the old way is still the only way, medical, ethical, fiscal, and potential legal problems are wide spread (Clawson 1999).

The fire service community, in many ways, has historically interpreted response time. It is critical, however, that a common terminology be established to define the elements of response time. This standardization will allow agencies to do a comparison that will provide both reliability and validity of data for agencies that participate in the self-assessment process. (Commission on Fire Accreditation International, 1999).

In an article in the Annals of Emergency Management (Conn, Conroy, Maslin, and Tidbits, 1999), this difference in how times are measured is further confirmed. Agencies use different time points as the start and end of their response intervals, which makes comparison of results directly related to response intervals across agencies or regions difficult. To maintain an

appropriate standard of pre-hospital emergency medical care throughout the states, the use of consistent standard terminology defining response intervals will help reach that goal. Commission on Ambulance Accreditation Service (CAAS) and NFPA 1710 set the standards for turnout times. Turnout times are defined similarly by CAAS and NFPA 1710 as the amount of time between dispatch time and travel time.

1.What are the accepted time standards for call processing?

NFPA 1710 *Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments* "sets minimum standards considered for the provisions for emergency medical services by career fire departments" (NFPA, 1710, 2010). Among the minimum standards contained within NFPA 1710 is a provision for response times. Response times covered in the standard include:

- Four minutes or less for the arrival of a unit with first responder or higher-level capability.
- Eight minutes or less for the arrival of an advanced life support unit.
- A performance objective of not less than 90 percent for the achievement of the time objective.

Fire departments and EMS establish a turnout time objective of 80 seconds, whereas CAAS requires 60 seconds during the hours of 0700-2200 and 90 seconds for hours between 2201-0659. Both require compliance with these turnout time objective 90% of the time.

NFPA 1221 *Standard for the Installation, Maintenance, and Use of Emergency Service Communications System* establishes 9-1-1 call processing times. The standard's purpose is to provide requirements for dispatching of appropriate emergency response personnel and to

establish the required levels of performance of emergency services communications systems (NFPA, 2009 p.5). This standard only addresses the handling of alarms (i.e.9-1-1 calls), stating that 90% of emergency calls shall be processed (call-taking to dispatch) within 60 seconds, and 99% of calls shall be processed within 90 seconds. NFPA 1221 also states that where alarms are transfer from a PSAP, the transfer procedure shall not exceed 30 seconds for 95% of all alarms processed.

NECC receives 9-1-1 calls directly transferred from Hamilton, Clermont, or Warren County Communications Centers. NECC handled 3,728 9-1-1 calls in 2010 related to fire and EMS emergencies 68% of those were EMS and 32% were fire related. NECC also handled 20,961 police related 9-1-1 calls. These stats where pulled from LSFD records management system, Firehouse Software Records System, Computer Aided Dispatch Records and from LSFD daily log records system. Each of the Records Management Systems (RMS) used to acquire data tracks times and locations of incidents by response district.

NECC's current Emergency Operations Manual (EOM) section 1201.00 covers day-to-day operations, radio procedures, and radio traffic. It fails to address PSAP transfers, time lines for processing 9-1-1 calls, and dispatching emergency medical services. NECC Standard Operating Procedures (SOP) fail to address Association of Public-Safety Communications Officials (APCO) training requirements for call-takers and emergency dispatchers. APCO standards identify minimum training requirements for both new and veteran Public Safety Telecommunicators. This position is typically tasked with receiving, processing, transmitting, and conveying public safety information to dispatchers, law enforcement officers, firefighters, emergency medical, and emergency management personnel.

APCO outlines a procedure when answering and dispatching units. The call-taker must verify the location and nature of the call, insure the caller is free of danger if possible, input the initial location and nature code into the CAD system, and dispatch appropriate units. The call taker is to keep the caller on line to provide current conditions of patients and to have caller meet first responders when they arrive. The APCO procedure also requires notification and initial dispatch of units, as well as providing crews with information needed such as type of call and a brief description. Providing the dispatcher has enough information gathered, the dispatcher should be able to dispatch the appropriate units to mitigate the emergency.

The International Fire Service Training Association's (IFSTA) manual for Telecommunication's (2001) breaks the total process into call taking and dispatching. The call taking process is broken down into two primary parts. First, the dispatcher must answer the call. Second, the dispatcher must obtain vital information, which is listed as: location, nature, time of incident, callers phone number, callers location, callers name and address. Once the call taking process is completed the dispatching process is implemented. The dispatcher must establish the response criteria and make a selection of resources. Once resource selection is determined those resources must be alerted. Although much of this information seems important, taking the time to get all of the caller's information prior to dispatching units seems excessive.

Another list of steps comes from Brett Patterson (2002, 911 Magazine). It outlines eight steps; call received, address confirmed, case entry, key questions, interrogation, response determined, units assigned, units alerted. Although this list seems more complete, some issues are still left unaddressed. The list does not capture the time it takes dispatchers to answer the phone. It does not specifically define key questions and it implies that a dispatcher completes interrogation prior to continuing with the process.

Key questions help dispatchers determine the where, what, who, and to what degree. Three of the key questions are considered essential and must be obtained prior to dispatch. The essential pieces of information are where (address), what (nature), and call back number to gain further information, if needed. Other questions that are deemed important such as who is calling, how old is the patient, is the patient breathing, and is the patient awake and talking are all call specific (Stelle, 1993).

The state of Ohio does not have mandated training standards, but does have recommended standards for certification under law 4742 (Codes.Ohio.Gov/orc/4742) which became effective in November 1997. According to the law, " emergency service telecommunicators" are encouraged to complete a minimum of 40 hours of instructions on such topic as effective communication skills: telephone techniques: law, fire and EMS terminology, radio discipline, disaster planning and responder safety. Telecommunicators must complete 8 hours of continuing education every 2 years.

2. What are the current call processing times for Northeast Communication Center (NECC)?

Northeast Communications serves the public safety communications needs for the City of Loveland and Symmes Township, with a combined population of 39,000. Northeast Communications answer the 911 and non-emergency telephone traffic and dispatch police, fire, EMS and public works for the area served. In addition, they monitor the City of Loveland Safety Center and the Symmes Township Safety Center in the absence of reception staff. Currently the operation is staffed round the clock by two trained public safety tele-communicators. There are two full-time employees and ten part-time dispatchers. The operation is housed in the lower level

of the Loveland Safety Center. This state of the art facility utilizes a computer aided dispatch system, computer based telephone system and 800 MHz digital radio system.

The aspect of communications that we are evaluating is the area of processing time. Processing time is defined as the amount of time that elapses between the answering of an incoming call until a dispatch action over the radio occurs. By policy, processing times for EMS calls must be sixty seconds or less 90% of the time on critical calls such as a non-breather, chest pain or trouble breathing.

Data Collection

Collection of processing times for incidents is handled through reviewing digital recordings of telephone calls and radio dispatches, then drawing a direct relative elapsed time relationship from the time the call was answered until the first dispatching action is performed. The intention is to collect objective data void of dispatcher personality. It is important to note that there are some variables that are beyond the control of the call takers such as caller ambiguity, workload in the center and technical issues. But in general, the collection of processing time is very straightforward. To establish a baseline for future implementation call data was sampled. The data collected was from calls that were handled from October 2008 through January 2009. There were eleven dispatchers' calls that were reviewed. Both Fire and EMS types of calls were reviewed and only the processing time critiqued. For each dispatcher, six of each type of call was randomly selected. To be selected, the calls had to be urgent or emergency requests for service. After the selection of the incidents was completed, a few calls were found to be initiated by officers via radio. These calls were subsequently discarded.

The Loveland – Symmes Fire Department utilizes the most appropriate system of measures to report its own performance and to compare its performance with other organizations

or with accepted standards. In the case of Fire/Rescue agencies and Emergency Medical Services, response time is one of the key factors that reflect the performance of an organization in relation to the service that is being delivered to its customers. In a true emergency situation, prompt response is often the most critical factor that determines success or failure. Call Processing Time is the portion of this that the dispatchers affect directly.

There is no single measurement that can be used to thoroughly analyze and compare our response time performance. Nevertheless, we try to report our performance in a manner that can be easily expressed and is comprehensible to our political authorities and residents. In the past, most agencies reported, “average response time” as the basic index of performance. More recently, agencies have adopted fractal reporting as a more appropriate performance measurement system. Our Emergency Medical Services have enjoyed accreditation since 1996 from the Commission on Ambulance Accreditation Services or CAAS. CAAS utilizes the fractal reporting of time for its measure of standard. NFPA has adopted the fractal reporting of time as its standard measure as well. To fully understand this we need to do a comparison of the different units of measure.

Fractal Call Processing Time

A fractal measure refers to how often a particular benchmark is achieved. This is very appropriate in situations where there is a definitive “pass/fail” point, or in the case of emergency response, a time that is considered “fast enough” versus “not fast enough”. A fractal measure can be used to compare the number of responses that are within the established standard with the number of responses that are not. If a patient is in cardiac arrest, the most important objective is to respond quickly enough to save the person’s life. If a building is burning, the key objective is to have firefighters on the scene in time to control the fire within a limited area. A fractal

reporting system measures performance in relation to the benchmark time that is considered “fast enough”. The benchmark is set at the upper limit of acceptable performance. If the benchmark is set, for example, at “7 minutes or less”, any response that takes 420 seconds (7 min:00 sec) or less is classified as a “pass” and any response that takes 421 seconds (7 min:01 sec) or more is classified as a “fail”. The measure is commonly expressed as “X” percent within 7 minutes or less. A system that achieves 80 percent within 7 minutes or less is clearly performing better than a system that achieves 60 percent within 7 minutes or less.

Average Response Time

An average is a calculated number that is intended to be representative of a set of data. Averages are commonly used to report and compare data of many types and most people understand and accept the basic concept of an average. An average is a value that reduces a range of information to a single number, although that number does not necessarily represent any value that is found within the set. For example, if the average height of a group of 5 people is 5 feet 6 inches, we tend to think of the “average person” as being that height. We may be oblivious to the fact that three of the people are less than 5 feet tall, while the other two are well over 6 feet in height. No one in the group is reasonably close to 5ft 6in. The average response time does not provide an adequate indication of performance for most situations. When we consider an average response time in relation to the “7 minutes or less” benchmark, the significance is difficult to interpret. If the average response time is reported as 6 minutes and 30 seconds, it appears that the objective is being met. In reality, the 6:30 average could be achieved with all of the reported response times under 7 minutes or with less than half of the responses less than 7 minutes. The distribution of response times makes a huge difference in the calculation of an average response time, particularly if the calls are concentrated in particular areas. If there is a cluster of the calls

in an area with short response times, the average goes down. A cluster of calls in an area with long response times drives the average up. Two clusters, one fast and one slow, can balance each other out.

Reporting an average response time is significant in some situations. For example, if the vast majority of responses fall within a relatively narrow band, such as between 4 minutes and 6 minutes, as change in the average response time can be indicative in an important trend. A change from 5 minutes and 15 seconds average response time to 5 minutes and 25 seconds suggests that response times are getting longer. It remains to be determined whether this shift resulted from heavier traffic that is slowing down response speeds or from an increasing number of calls in the more distant parts of the coverage area.

Median Response Time

Average response time is often confused with median response time. The average is the arithmetic mean value, which must be calculated. The median is the central value in a range of data – half of the data points are higher and half are lower than the median.

If the values in a data set are:

3 – 3 – 3 – 4– 12 – 12 – 12

The average is 7 (sum of 49 divided by 7) The median is 4 (half of the values are 4 or less; half are 4 or greater).

3. What is the present response time performance for Loveland Symmes Fire Department (LSFD)?

4. What factors affect NECC call processing time?

In order to identify delays during call processing one must understand the individual steps in the process. It is important to understand that processes are primarily responsible for system inefficiency. Although individual performance affects output, processes limit individual performance (Patterson, 2002). If sound times standards are to be established the job cycle needs to be analyzed and standards set for each component (Murry, 2001). Commission on Fire Accreditation International (CFAI) research indicates unless call process time is evaluated, potential problems may exist (Coleman, 2001). A critical task analysis should be used to establish times and resources needed to complete a task (Cady, 2003). In order to improve a process, it must be clearly defined. First, the beginning and end points of the process must be defined. It seems clear that the beginning and end points would be the first ring of the 9-1-1 call until units are alerted. With the beginning and end of the process defined, the steps between must be identified. In an effort to capture the entire call processing, the following list of eight steps where identified: calling 9-1-1, call answered, key questions (address, nature), call entry (nature and location), response determined, units assigned, units alerted. With a good list of steps established, one can analyze each step in the process to determine where delays may occur. The time to answer the call is the first segment. The NFPA standards are within 15 seconds 95 percent of the time and within 40 seconds 99 percent of the time (Aiken et al, 2007). The next step in the process is asking key questions to establish the what, where, who and enough non-essential questions to establish degree and extent. This step in the process can somewhat vary for several reasons. First, often individuals who are calling to report an emergency are scared, upset, or confused making extracting information difficult and or time consuming (IFSTA, 2001). During most call questioning EMS units are assigned within one minute (Neely, Norton, and Schmidt, 2000).

Call entry is the process of entering the call into the CAD system. It would seem delays in this area would depend on the amount of data required, the degree of automation, and the ease in which additional data is entered. Depending on the level of wireless information available, cell phone calls to 9-1-1 may or may not provide any of the traditional information provided by landlines. During the interrogation phase of the process the dispatcher gathers enough information to make a reasonable dispatch decision and gathers enough information to aid the response. While the NECC computer aided dispatch system (CAD) will automatically recommend the closest unit that is available, other systems will require that the dispatcher manually identify and select the closest available unit for dispatch. In a CAD system, selecting units merely means adding the unit to the call. Obviously the more automated the system is the less time this step takes. Notifying units is the last step in call processing. The method by which units are dispatched through NECC is via the activation of the VHF paging system, which alerts pagers to activate house tones that notify personnel of the call. The dispatch is simulcast through the 800 MHz radio system. Response data is also sent to Mobile Data Computers (MDC) in the units.

Additional delays that can exist in the processing of 9-1-1 calls are language barriers. The city of Loveland and Symmes Township is made up of 94.6 % English speaking, 1.3 % Spanish speaking, and 4.1 % other speaking languages (2010 US Census).

PROCEDURES

The research methods used in this research paper consisted of Internet searches, personal interviews, and reviews of the LSFD Records Management System and NECC computer aided dispatch records. The descriptive research conducted for this project contained three main parts.

Research for this paper began with a detailed review of literature related to response times and communication center standards. This portion of the research included a detailed review of NFPA 1221, NFPA 1710, and the LSFD Emergency Operations Manual in order to determine the recommended standards and policies as they related to the operations of the NECC. The review of the literature is explained in greater detail in the previous section.

The first portion of the descriptive research was a survey of the five communications centers that the LSFD utilizes in some manner for emergency dispatch (Hamilton, Warren, Clermont, Union Township-Clermont County, and NECC) with personal interviews conducted with the officer in charge of the communication center. This survey was geared toward defining what similarities or differences existed between the communications centers and determining if any call-processing problems existed in those agencies (Appendix #1). Topics discussed for this survey include:

- Policy on transferring 9-1-1 calls
- Type of computer aided dispatch system is used in each communication center
- Emergency Medical Dispatch information
- Percentage times for processing of ALS or BLS 9-1-1 calls.
- Percentage times of call processing under and over, NFPA

The second portion of the descriptive research was a survey of firefighters, line officers, and fire chiefs (Appendix #2). The second survey was sent to nine area departments, 3 in Hamilton County, 3 in Clermont County, 3 in Warren County with 90 surveys returned. The departments surveyed were of similar demographics when compared to LSFD. The survey asked for percentage stats dating back 1 year for emergency dispatch from their communication center, and their percentage of response times, if known. The survey was devised to learn more about those departments and establish the relationships they have and results they receive from their emergency dispatch centers. Topics covered in this survey were:

- Does the department operate their own communication center?
- What level of service do they provide (ALS or BLS)?
- How do they track their time?
- Response time SOGs/SOPs
- Is their department CAAS certified?
- Why they are or are not CAAS certified
- Who they feel is responsible for not meeting response time guidelines
- Have they ever been involved with legal issues involving response times?

The third portion of the descriptive research was a gathering of pertinent call-handling and response times from the LSFD RMS during the time period from June 2011 through June 2012. Each month during this time was reviewed and the following information was gathered:

- Total calls for the month
- Average time from time call was received in NECC to time of dispatch
- Average time from dispatch to unit en route
- Average time from dispatch to first unit on scene

NECC utilizes the Alerts Tracking System in its CAD system, which time stamps each call and automatically records call origination, call entry, and unit assigned time. The purpose of this analysis was to get a clear idea of NECC call processing times relative to NFPA 1221 standards. Nature codes of medical calls only were extracted from the CAD and were imported into Microsoft Excel and evaluated. The data was evaluated for its average, median, maximum, and minimum standard deviation. The information, as it relates to the discussion, is located in a chart in the results section.

The results of the research was then gathered, analyzed, and compared to the necessary literature. From this process, recommendations were reached.

Limitations of the Study

One limitation of this study involves the training, expectations, and experience of dispatchers. The survey instruments and review of NECC and LSFD policies and procedures were not intended to investigate the training levels of dispatchers employed by NECC when this project initially began. Towards the end of this project it became apparent that training and experience might have a significant impact on call-processing times. This should be further investigated in the future. Dispatcher training must be compared with the standards set forth in NFPA 1061, *Standard for Professional Qualifications for Public Safety Telecommunicator.* This project has been focused on call-processing times as they influence on-scene emergency response times.

Another limitation of this study was the records management systems of the LSFD and NECC. Midway through the research of run time data, a new records management system was implemented that integrates records from NECC and LSFD into one location. The switch to the new system may have lead to potentially skewed and/or missing data. In addition, no records

management system used by the LSFD or NECC differentiates run time data between ALS and BLS calls, as NFPA 1710 dictates. The change in records management systems was not in the researcher's control in this case and any research on call-processing conducted by other individuals in their departments must be aware of flaws in records management systems.

The last limitation of the study is that pre-NECC call handling times are not tracked by NECC, LSFD, or any PSAP that answers 911 calls and transfers them to NECC. This problem is unique to the associate PSAP model run by NECC. This is added time that effects the response time of emergency vehicles that is virtually an unknown variable. The impact that this variable has on the emergency service that is provided to the external customer is impossible to measure.

RESULTS

Table 1

Results of survey conducted among the five Communication Centers that serve LSFD as a PSAP (see Appendix #1 for survey questions)

	N	%
Civilian Call-Takers	3	60
Uniformed Call-Takers	2	40
Unified Call-Takers (Police & Fire)	5	100
Print-Trac CAD System User	2	40
Interact CAD System User	1	20
Alerts CAD System User	2	40
Use EMD Software	3	60
Use no form of EMD	2	40
Average EMD processing time	no answers	no answers
Average ALS call processing time	no answers	no answers
90 % of time meet call process goal	2	40%
95% of time meet call process goal	2	40%
100% of time meet call process goal	1	20%

The result of this survey indicate that all of the dispatch centers that serve LSFD as PSAP (Hamilton, Clermont, Warren, Union, and NECC) are meeting their EMS call processing goals as defined by NFPA 1221 within 90% of the time. Some are meeting their call processing goals at even higher rates than 90%. From this sample it is apparent that call processing goals are met regardless of whether the dispatcher is uniformed or civilian and regardless of whether the

dispatch center uses dispatchers to handle both fire and police calls. With no responses regarding EMD response times, the evidence is inconclusive on the exact effect EMD has on call processing times. Any communications center that wishes to implement EMD, must examine this topic further.

Table 2

Results of survey conducted among firefighters and officers regarding communication centers utilized in their local jurisdictions. (see appendix #2 for survey questions)

	N	%
Dept. operates dispatch center	10	11.1
Dept. does not operate dispatch cntr.	80	88.8
ALS staffed ambulances	90	100
Response time tracked in minutes	31	34.4
Response time tracked in seconds	59	65.5
Response time SOP defined by dept.	90	100
CAD times used in EMS reporting	27	30
CAD times not used in EMS reporting	63	70
Dept. meets 1710 times for BLS	68	75.5
Dept. does not meet 1710 times for BLS	6	6.6
Dept. meets 1710 times for ALS	68	75.5
Dept. does not meet 1710 times for ALS	6	6.6
No answer on meeting 1710 times	16	17.7
FD personnel at fault for time issues	26	28.8
Dispatcher at fault for time issues	38	42.2

	N	%
No response time issues	9	10
No answer to question 9	17	18.8
Dispatch meets 1221 times	68	75.5
Dispatch does not meet 1221 times	6	6.6
No answer to question 10	16	17.7
Non-CAAS accredited	90	100
Cost factor to get CAAS accreditation	17	18.8
Not familiar with CAAS accreditation	21	23.3
No value to CAAS accreditation	52	57.7
Combination staffing	80	88.8
Full-time staffing	10	11.1
Serve population of 25,000-50,000	80	88.8
Serve population of 50,000+	10	11.1
Survey participant was Chief Officer	28	31.1
Survey participant was Training Officer	6	6.6
Survey participant was Line Officer	17	18.8
Survey participant was Firefighter	39	43.3

The results of this survey indicate that most of the firefighters and officers in departments that are similar to LSFD conduct EMS operations in relatively the same manner and environment. These firefighters typically work in combination fire department with defined response guidelines and provide ALS to a population of 25,000 or more people. By a 2-1 margin,

firefighters are required to track response times to the second. However, by a 70%-30% mark, firefighters do not use response time data directly from the CAD when completing EMS reports. This can lead to an inconsistency in times and could actually effect times in a positive or negative manner for the department.

LSFD appears to be unique among those surveyed because NECC is the direct arm of the fire department. Most firefighters that were surveyed work for a fire department that does not operate their dispatch center. Unlike these other departments, LSFD has the unique opportunity to direct the operational efforts of NECC because LSFD is the primary stakeholder in the effectiveness of NECC.

It is interesting to note that most firefighters and chief officers surveyed report that their fire department is meeting NFPA 1710 response time standards for EMS calls (75.5%) AND their dispatch center is meeting NFPA 1221 call processing time standards (75.5%). However, there still seems to be a perception among members that there are response time issues within these fire departments. 42.2% claim that the dispatcher is at fault and 28.8% claim the fire department personnel are fault when a response time issue arises. Only 10% of those surveyed reported that they do not experience response time issues.

Another interesting piece of information gained from this survey revolves around CAAS accreditation. No other department surveyed is CAAS accredited. 57.7% of firefighters and officers surveyed indicate that CAAS has no value to the department, 18.8% state that it is cost prohibitive, and 23.3% are not familiar with the accreditation at all. While not in the scope of this project, this suggests that informational research and cost-benefit analyses must be examined for a fire department that desires EMS accreditation.

Table 3

Average Call-Processing and Response Times by month for NECC and LSFD from June 2011-June 2012-EMS calls only (in minutes and seconds)

Month	Time of Call-Dispatch	Dispatch-On Scene
6/2011	1:47	3:37
7/2011	1:18	4:09
8/2011	1:27	4:14
9/2011	9:36*	3:49
10/2011	4:07*	3:39
11/2011	1:19	3:59
12/2011	1:12	5:14
1/2012	0:57	3:09
2/2012	4:49*	3:08
3/2012	0:48	3:37
4/2012	0:43	3:18
5/2012	0:43	3:17
6/2012	0:37	5:39

Source: NECC CAD Records

As NECC has indicated in the returned survey that it is meeting fractal call processing goals and LSFD has indicated in their returned survey that they are meeting NFPA 1710 response times standards 90% of the time, it became more relevant to review the above data on the basis of average times to determine where improvements could be made in the response process (call-handling or response). These call handling and response time guidelines are

discussed in LSFD EOM 701.00 (Appendix #4) in addition to NFPA 1221 and NFPA 1710. Despite these guidelines in EOM 701.00, the LSFD Fire Chief issued a department General Order (Appendix #3) requiring response times to be five minutes or less. If a response time is not five minutes or less, the run report is flagged and followed up on by the fire department administrative staff. Firefighters are then required to fill out paperwork to explain why the deviation from the general order response time guideline has occurred. The Fire Chief selected the five-minute benchmark since this was the average response time (time of dispatch-on-scene) at the time of the General Order.

While work continued on this research project, NECC changed to an automated dispatch system. This system went fully online in March 2012. The new system allows dispatchers to gather critical information and then dispatch the call while simultaneously gathering additional information about the call. This process has decreased the time of call to dispatch average time by eleven seconds since implementation and the time of call to dispatch average time has decreased by one minute and ten seconds since June 2011 when NECC was still operating on traditional dispatch. Response times have appeared to improve as well, since firefighters get pre-alert information regarding type of call and address before the automated dispatch begins. Dispatch to on-scene times has decreased from a traditional dispatch high of 5:14 in December 2011 to a automated dispatch low of 3:17 in May 2012. Data for call processing times from the months of September 2011, October 2011, and February 2012 appear to have abnormally high average call processing times due to the fact that the new automated dispatch system went through trial periods during these time frames and these periods may have led to inaccurate data in the CAD system. These times were not held in high regard when evaluating the data.

DISCUSSION

NECC has been successful in meeting its fractal call processing time requirements and LSFD has been successful in meeting its fractal response time requirements for EMS. However, a perception still exists within both organizations that dispatchers and firefighters are "slow" when it comes to doing their respective jobs. Average call processing and response times appear to indicate that improvement has been made by dispatchers and firefighters on call processing and response times. There appear to be two main reasons for these improvements. The first is the enforcement of the General Order declaring that all runs must have a response time of five minutes or less or be accompanied by paperwork declaring a reason for a deviation of the General Order. The enforcement of the General Order has created a culture where responders do not wish to complete paperwork in addition to their EMS reports and especially do not desire to subject themselves to disciplinary action over response time issues. It has not been apparent yet whether firefighters have exchanged another important variable, such as personal and crew safety, in exchange for the improvement in average response time.

The second reason for the improvement in call processing and response times appears to be the automated dispatch system. Early returns indicate that dispatchers are getting vital information quicker, relaying that to the firefighters quicker, and firefighters are responding quicker because they have the important information earlier than ever in the response process. The early information indicates that the automated dispatch system has had a bigger impact on call-processing and response time than any other variable. Additional information in the future will provide a more telling picture.

The results of the project have exposed another important variable in response times that is not measured by any party involved with LSFD or NECC. 9-1-1 calls that are transferred from

PSAP's to NECC are not tracked for transfer time statistics. NFPA 1221 indicates that such transfers should occur within 30 seconds, 95% of the time. While NECC and LSFD data indicate that fractal time objectives are being met and average times are improving, the transfer time is still "real" time in which the external customer must wait for EMS to arrive. Excessive transfer times could lead to a public perception that EMS response was not quick enough, because it was in fact delayed. If there is trends that indicate fast or slow call transfers, LSFD and NECC are not aware of them. While there have not been a significant level of complaints about response times from external customers, this variable still has an impact on "true" response system and warrants further attention.

Another research variable that was impossible to evaluate, but warrants consideration for the NECC was dispatcher training. There are no training standards for the civilian dispatchers dictated by NECC policy. No training records exist. A newly hired dispatcher can be hired with no previous experience or training. They receive an overview of the CAD, the phone system, and begin a basic telecommunications course offered by the Association of Public Safety Communications Officials (APCO). The dispatcher can conceivably begin dispatching on his or her own prior to completing this course or spending any time observing an experienced dispatcher. Typically, the new hire spends some time observing; however there is no policy that indicates how long observation must be done. Much of the dispatcher training comes from on the job experience.

RECOMMENDATIONS

This research project has resulted in six key recommendations for the LSFD and NECC. Fire departments and communication centers can utilize these recommendations as they fit with their dispatch and response models.

The first recommendation concerns the improvement and maintenance of records management systems. Records management systems begin with the correct input of data. The system is only as good as the data that is entered in it. Departments must stress that accurate data must be quickly entered into the dispatch CAD or RMS in order to depict correct times even if they depict the department in a negative manner. As the reader saw from above, data can be easily flawed or incomplete when the records management system is aggravated. Call processing and response time data should be shared in one location so that consistent reporting takes place and departments can go to one source to get time data. When records management systems are upgraded or changed it is imperative to consider past data before making any changes to the RMS. Historical data must be archived and easy access to it should be desired. Departments cannot allow past data to become corrupt in the RMS transfer, especially in a litigious society where information from several years ago may be requested instantly.

Communication centers that do not have standards for dispatcher training should implement these immediately. Dispatchers are the first point of contact that an external customer has with an emergency service and the dispatcher's action directly reflect upon the fire department whether the fire department oversees the dispatch center or not. NFPA 1061, *Standard on Qualifications for Public Safety Telecommunicator* is a great starting point for dispatcher training. This is a consensus national standard that establishes baseline training. Communication centers can establish a recruit orientation program for dispatchers similar to

what many fire departments do for new recruits. Dispatcher recruits can complete orientation exercises and demonstrate job performance requirements (JPR's) prior to dispatching on their own. As the dispatcher's career progresses beyond recruit status, communication centers can establish an apprentice program for the dispatcher to learn the trade from a more experienced dispatcher who can serve as the apprentice's mentor. This initial training and continuing education must be recorded in the training RMS for all communications centers. Most fire departments, including LSFD, have programs like this set up for their firefighters. They should do it for their dispatchers as well. Fire departments that do not operate their own dispatch centers are doing their internal and external customers a disservice by not, at a minimum, requesting better trained dispatchers.

The third recommendation flows from dispatcher training and JPR's. Fire departments should consider the use of Emergency Medical Dispatch (EMD). Training dispatchers in and using EMD protocols serves two purposes. One purpose is that dispatchers are trained in the basic principles of emergency service delivery. This training gives dispatchers a basic idea of how the provision of EMS works so that they are more familiar with the job that first responders are doing. The second purpose, and perhaps the most important, is that EMD provides the patient with quicker access to some life saving interventions. It was discussed earlier that earlier access to EMS provides for better patient outcomes. Communications centers that do not provide EMD at least owe it to their external customers to examine and evaluate the benefits of having EMD trained dispatchers on duty. Fire departments who do not control their own dispatch centers have a responsibility to inquire about this as well.

The next recommendation is that communication centers and fire departments that operate the associate PSAP model like NECC and LSFD need to track ALL times related to call

processing. As discussed, the “true” total response time cannot be determined if the call transfer times are not tracked and examined. NFPA 1221 has set forth a standard on call transfers and communications centers and fire departments using the associate PSAP model should follow this standard or at least define a call transfer time standard within their own standard operating guidelines. Until this occurs, “true” total response time cannot be calculated and evaluated. Communication center models that do not require call transfers obviously do not need to follow this recommendation.

The fifth recommendation follows the decision of NECC and LSFD to utilize an automated dispatch system. As stated, four months of returns show that this system has drastically improved call processing and to an extent it can be reasoned that automated dispatch helped lower overall response times during this time period. This trend can be expected to continue. Communication centers and fire departments should utilize technology to the best extent possible given the proper cost-benefit relationship exists. It is recommended that the times generated by the new automated dispatch system be reviewed monthly through the first year of use and then at least quarterly after that. This will help identify any trends that need addressed so that they can be handled accordingly and in a timely fashion. Communication centers and fire departments need to stay of top of the new technology trends in order to provide the best possible service. It is conceivable that future technology may drop call processing and response times even more. Only future research will tell if that will be the case.

The final recommendation is that communication centers and fire departments should live by one standard operating guideline. In the case of the NECC and LSFD, the department has a standard operating guideline, EOM 701.00, that requires call processing and responses to meet fractal time requirements. For EMS calls, the EOM states that the time units must be on the

scene from the time the call is received in dispatch is eleven minutes 100% of the time, worst case scenario. The department's General Order now indicates that all units must be on scene from dispatch within five minutes 100% of the time. These conflicting orders lead to confusion in the organization on what is required. It is important to pick a standard and live by it. If that is an NFPA standard, then so be it. If the department is required to extend time requirements beyond the NFPA standard due to any reason, such as long travel distance, a call processing and response time benchmark must still be established by the communication center and/or fire department. If the department wishes to be better than the NFPA standard that is fine too. However, the department must be cautious here. Attempting to exceed the NFPA standard could result in problems. First, in an attempt to achieve faster response times, crews may compromise personal safety by running to apparatus to respond quickly or operating emergency vehicles in a reckless manner while responding to an emergency. Second, if community leaders become aware that a fire department is exceeding national consensus standards agreed to by industry leaders, administrators, elected officials, and the public may view this as an excessive amount of emergency resources and look to make cuts where they may be not be warranted. Fire departments should be aware of this potential problem.

In summary, communication centers and fire departments should provide better training for dispatchers, properly maintain records management systems, accurately record all pertinent times, examine the use of better technology, and avoid working off of conflicting operating guidelines/orders. If these entities, like NECC and LSFD, follow these recommendations the perceptions and realities surrounding call processing and response times will improve dramatically.

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APPENDIX 1 – SURVEY INSTRUMENT ON CALL PROCESSING TIME FOR AREA COMMUNICATION CENTERS THAT SERVE LSFD AS A PSAP

Ohio Fire Executive Program Applied Research Project

This survey will be used as a data collection tool for an applied research project in the Ohio Fire Executive Program, please return the survey before January 10, 2012

Call Processing Time Questionnaire

1. What is the name of your agency?

2. Do you use Civilian or Uniformed call takers?
   A. Civilian
   B. Uniformed

3. Do you use Agency-Specific or Common (unified) call takers?
   A. Agency-Specific
   B. Common (unified)

4. Which Computer Aided Dispatch system do you use?

5. If you use EMD, which product do you use?
   A. Software
   B. Cards

6. What is your average EMD processing time for ALS events?

   (EMD processing times defined as the time interval from launch of the EMD product to sending the initial call type to CAD)

7. What is your average call processing time for ALS incidents?

   (Call processing times defined as the time interval from receipt of 911 calls to dispatch)

8. Do you define call-processing time differently than NFPA1701/1221?

A. Yes
B. No

9. What percentage of time does your agency meet your call processing time goals for ALS incidents?
____%

Thank you for participating in this survey, please provide contact information for any follow-up questions.

APPENDIX 2 – SURVEY INSTRUMENT FOR FIREFIGHTERS AND OFFICERS REGARDING THE COMMUNICATION CENTER OF PRIMARY USE

Ohio Fire Executive Applied Research project

2011

This survey will be used to, collect data for a research project I am conducting for The Ohio Fire Executive Program. The survey applies to the following research questions.

1. Does your department operate its own Emergency Dispatch Center?
   A. Yes
   B. No

2. Has your department been involved with a legal issue involving response time?
   A. Yes
   B. No

3. Is your Emergency Medical Services staffed by?
   A. ALS/Paramedic
   B. EMT/Basic
   C. First Responder

4. When recording the unit respose times for incidents, does your department track time to the seconds, minute, not at all?
   A. Seconds
   B. Minutes
   C. Not at all

5. Is there a response time standard/guideline in your department SOG/SOP?
   A. Yes
   B. No
   C. Our department has no SOG/SOP

6. Does your department use computer aided dispatch times for reporting?
   A. Yes
   B. No

7. Does your department meet NFPA 1710 Standard for BLS incidents in 4 minutes or less 90% of all incidents?
   A. Yes
   B. No

8. Does your department meet NFPA 1710 standard for ALS incidents in 8 minutes or less 90% of all incidents?
   A. Yes
   B. No

9. If your department is not meeting response time standards, whom do you think the responsibility falls on?
   A. Communication Center
   B. Personal
   C. Time of day/night
   D. My department has no response issues

10. Does your department's communication center meet NFPA 1220 standard for call processing?
    A. Yes
    B. No

11. Is your department CAAS Accredited? (Commission on Accreditation of Ambulance Service)
    A. Yes
    B. No

12. If your answer was No to question #10, why?
    A. Cost
    B. No value to your department
    C. Not familiar with CAAS
    D. Department unable to achieve CAAS standards or maintain them

13. Which of the following categories best describes your department?
    A. Volunteer
    B. Full Time
    C. Part Time
    D. Combination

14. What best describes the population your department serves?
    A. 10,000
    B. 10,001-25,000
    C. 25,001-50,000
    D. 50,000 plus

15. What best describes your position in your department?
    A. Chief Officer
    B. Training Officer
    C. Line Officer
    D. Firefighter

APPENDIX 3 – LSFD GENERAL ORDER REGARDING RESPONSE TIMES

The Office of the Chief has been monitoring the response times since the first of the year and noticed an increase in our response times. Since the response times have increased the following policy will be enforced;

-All units need to be en route during the day within 30 seconds or less
-All units need to be en route at night within 1 minute or less
-All units need to be on the scene from time of call to on scene within 5 minutes or less

The District Chief's will be monitoring all runs and issuing yellow, green, or pink flags on all reports that fall short of the response times policy. If you have any questions about this policy please see your District Chief.

APPENDIX 4 – LSFD EMERGENCY OPERATIONS MANUAL SECTION 701.00

RELATED TO DEPARTMENT RESPONSE TIME STANDARDS

EMS PROCEDURES **EMERGENCY OPERATIONS MANUAL**
Documentation **6-01-06 PAGE 8 OF 9**
EOM 701.00

Response Standards are as follows:

Quality Assurance

Dispatch Processing

—	<=: 59 secs.	90%
—	<=: 90 secs.	100%

Dispatch Enroute

—	<=: 59 secs.	90%
—	<=: 90 secs.	100%

Enroute to On Scene

—	<= 5 mins. and 59 secs.	90%
—	<= 7 mins. and 59 secs.	100%

Response Time Standards are set by the Fire Chief, in conjunction with CMO, and CAAS total response time will be 7 minutes and 59 seconds, or less, 90% of the time.

Director of Communications has set that calls received shall be dispatched less than 60 seconds 90 % of the time. A monthly audit will be conducted thru Q/A within communications to make sure this is being accomplished. Refer to the Communications Director for Policy.

The Fire Chief has set standards that all units dispatched shall mark on the air within 1 minute during the day, and 90 seconds at night. A monthly audit will be conducted thru Q/A within the EMS Division to make sure this is being accomplished.

Yellow Flag- This form will be used to flag all reports that do not meet protocol standards (i.e. documentation problems, questionable procedures, protocol/EOM deviation). If any problems exist it will be forwarded and addressed in the following order:

Policy Violation	**Protocol Violation**
l	l
Shift Supervisor	Chief Medical Director
l	l
Director of Operations	Director of Operations
l	l
Fire Chief	Fire Chief
l	l
Employee	Employee

APPENDIX 5 – ORIGIN AND DEVELOPMENT OF NFPA STANDARDS 1061, 1221, AND 1710

Origin and Development of NFPA 1221

This standard dates back to 1898. Originally, it was part of a general standard on signaling systems, but the material on municipal fire alarm systems was separated from the general standard in 1911. This standard has been revised and reissued in editions dated 1904, 1911, 1926, 1934, 1940, 1941, 1946, 1948, 1949, 1950, 1952, 1954, 1955, 1956, 1962, 1963, 1964, 1967, 1973, 1975, 1978, 1980, 1984, 1988, 1991, 1994, 1999, 2002, and 2007.
The 1999 edition of NFPA 1221 was a result of very hard work by committee members, especially the previous chairman, Evan E. Stauffer, Jr. The goal of the committee was to completely rewrite the standard to reflect the following: an emergence of joint communications centers, the increase in technology-based information systems that assist both users in the communications center and users in the field of operations, and the role communications play in emergency scene operations within the Incident Command System. To reflect the fact that NFPA 1221 is applicable to all emergency responders, not just the fire service, the title was changed to *Standard for the Installation, Maintenance, and Use of Emergency Services Communications Systems*.
The 2002 edition of this document continued to enhance the capabilities of personnel assigned to communications centers as well as the interoperability of systems. Because technology is continually changing, committee members began to assess potential changes to the next edition of this standard. It is incumbent on both users and enforcers of this standard to understand the impact of this standard, both in the area of service delivery and on the safety of those emergency response personnel delivering those services.
Competing interests and priorities in a communications center need to be addressed by the authority having jurisdiction to develop standard operating procedures on how calls for service are processed, dispatched, and tracked. The mission of the communications center should be to serve as a conduit between those requesting services and those providing those services. This standard with its current revisions provides the requirements to accomplish that mission.
The 2007 edition of NFPA 1221 was a complete revision incorporating the requirements of the *Manual of Style for NFPA Technical Committee Documents*. As part of the 2007 revision, the committee restructured several chapters and added a new chapter on data network security and several new sections. Subsequently, all chapters were renumbered to accommodate those changes. The entire document was reviewed and editorially updated to clarify requirements and to clarify ambiguous language.
The 2010 edition of NFPA 1221 has added requirements to include an emergency fire plan to safeguard personnel and minimize disruption of vital public safety communications. New communication centers and buildings in which they are located are now required to be protected from approach of unauthorized vehicles or to have the building designed to be blast resistant. The committee also has addressed the need for reliable in-building tactical emergency communications by developing performance requirements for two-way radio communication enhancement systems.

Origin and Development of NFPA 1710

In 2001, the first edition of NFPA 1710 was issued. The development of that benchmark standard was the result of a considerable amount of hard work and tenacity by the Technical Committee members and the organizations they represented. That standard was the first organized approach to defining levels of service, deployment capabilities, and staffing levels for substantially career fire departments. Research work and empirical studies in North America were used by the Committee as a basis for developing response times and resource capabilities for those services, as identified by the fire department.
Following the issuance of the first edition, the NFPA Standards Council asked the Technical Committee to begin the

revision process for a 2004 edition of the standard. The Committee formed several Task Groups to look at various aspects of the document. However, recognizing that the standard had not been fully field tested, the extent of the changes proposed were minimal with a cleanup of definitions, the addition of wording regarding equivalency in the annex, and clarification that the discussion on rate of fire propagation in the annex involved unsprinklered rooms.
This edition of NFPA 1710 standardizes and refines terminology and definitions used in the document. Particular attention was paid to terminology for time frames for the various events that occur from event initiation to the end of the fire department's involvement with the incident. This includes recognition that there is a time interval to initiate action or intervene at the end of travel time and before control and mitigation actually begins. The requirements for time frames for alarm handling have been revised to correspond to changes being made to NFPA 1221. The time allowance for turnout for fires and special operations was lengthened to 80 seconds but the time measurement was defined to start at the beginning of the transmission of response data to the emergency response units or emergency response facilities. All times shown as both minutes and seconds were changed to seconds only as that is the level of precision in which the committee intends time to be measured.
An application section was added in Chapter 1. The travel times for units responding on the first alarm were clarified to indicate the first unit must arrive within 4 minutes travel time and all units must arrive within 8 minutes travel time. The quadrennial report required to be provided to the AHJ in the previous edition has been changed to an annual report.
The annex material related to the requirement stated for an initial full alarm assignment capability has been moved to the body of the standard to clarify that the requirement applies to a structure fire in a typical 2000 ft^2 (186 m^2), two-story single-family dwelling without basement and with no exposures. In addition, wording was added to require additional resources be deployed on fires in occupancies that present hazards greater than the two-story single-family dwelling.
The community-wide risk management model that has been in an annex to NFPA 1720 has been added as an annex to NFPA 1710.
The work done by the Committee provides the user with a template for developing an implementation plan on the standard. Most important, it provides the body politic and the citizens a true picture of the risks in their community and the fire department's capabilities to respond to and manage those risks.

Origin and Development of NFPA 1061

The Committee on Public Safety Telecommunicator Professional Qualifications was organized in 1992 to have primary responsibility for professional qualifications for public safety dispatchers. The first edition of NFPA 1061 was published in 1996.
For the 2002 edition, the committee reviewed the 1996 edition of the standard and updated some JPRs, requisite knowledge, and requisite skills where needed. The entire document was reformatted to comply with the new *Manual of Style for NFPA Technical Committee Documents.*
For the 2007 edition, the committee has made minor revisions in the existing chapters to reflect current technology and terminology. The committee has also added a new chapter for Public Safety Telecommunicator III. This level responds to the command post of a large incident to provide communications and documentation for the command post.
In Memoriam, September 11, 2001
We pay tribute to the 343 members of FDNY who gave their lives to save civilian victims on September 11, 2001, at the World Trade Center. They are true American heroes in death, but they were also American heroes in life. We will keep them in our memory and in our hearts. They are the embodiment of courage, bravery, and dedication. May they rest in peace.