Development of a Fireground Communications Standard Operating Guideline

For Erie County

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Certification Statement

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

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Abstract

The fire departments within Erie County, including the Perkins Township Fire Department, have made a commitment to increasing interoperability between the departments. One aspect of interoperability which must be considered is fireground communications. The technical aspect of fireground communications has seen much improvement. However, there has been little focus on the human side of fireground communications. The problem was Erie County had no standard operating guideline for fireground communications. The purpose of the action research conducted was to develop an Erie County fireground communications standard operating guideline. Original research was conducted, through the dissemination of a survey to Erie County firefighters, to answer the research questions: a) what barriers to effective fireground communications have been identified by Erie County firefighters? b) what practices do Erie County firefighters feel would improve fireground communications? c) what components do Erie County firefighters believe should be included in an Erie County fireground communications standard operating guideline?

The research identified various barriers and best practices for fireground communications. The research also identified multiple components to be included in a fireground communications standard operating guideline for Erie County. Recommendations included: review, revision, and adoption of the Erie County Fireground Communications Standard Operating Guideline. Recommendations also indicate radio communications should be integrated into fire department training as much as possible.
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The fire departments and personnel within Erie County, over the last several years, have made a commitment to improving operations on multi-department or county emergency events. As part of this process there has also been a movement to improve interoperability and consistency amongst the various entities. In order to achieve interoperability, the Erie County Fire Chiefs’ Association has asked for the development of county based standard operating guidelines.

A critical component to interoperability between multiple agencies is communications. There are two main factors to be considered regarding communications: the technical aspect and the human aspect. The technical aspect includes components such as radio hardware, radio frequency procurement, and radio tower installation. Whereas the human side entails components such as how messages are conveyed, received, and interpreted. Erie County personnel have done much to address the technical aspect of fireground communications; however, little has been done to address the human side. The lack of attention to the human factor has led to the need for more consistent fireground communications. The problem is there is no standard operating guideline for fireground communications during multi-department events. The purpose of the research is to develop an Erie County fireground communications standard operating guideline.

The action research method will be utilized to answer three research questions. The research questions are: a) what barriers to effective fireground communications have been identified by Erie County firefighters? b) what practices do Erie County firefighters feel would improve fireground communications? c) what components do Erie County firefighters believe should be included in an Erie County fireground communications standard operating guideline? The intent of the original research was to identify information to aid in the development of a
fireground communications standard operating guideline for Erie County. The creation of a fireground communications guideline for Erie County should help improve interoperability amongst Erie County fire departments and help reduce the risk of vital radio transmissions being missed by personnel.

**Background and Significance**

The citizens and visitors of Erie County of Ohio are protected by thirteen fire departments. The fire departments include volunteer departments, several combination departments, and one fully career department. The Perkins Township Fire Department, comprised of full-time and part-time personnel, is one of the departments operating within Erie County. There has been considerable effort made by the departments within Erie County to share resources by increasing mutual and automatic aid agreements. This sharing of resources has revealed a need for consistency of operations amongst the various departments. Erie County personnel have identified the need for county-based standard operating guidelines as a means to improve operations. One of the guidelines which have been identified to be addressed is that of fireground communications.

There is not one specific incident which has caused concern with respect to fireground communications in Erie County. More so, communications has been identified as a need to be addressed in order to prevent a crisis before it occurs. A common thread of after-action critiques of fireground operations conducted in Perkins Township is that communications could have been better. Typically, an important message was not relayed, the message was missed, or there was confusion over the meaning of the message.
Presently, the Perkins Township Fire Department and the other departments within Erie County are looking at methods to share resources and improve operability amongst the departments. One method of promoting this interoperability has been the creation of standard operating guidelines for Erie County fire departments. Communications is obviously an integral part of fireground operations. Currently there is no standardized method of what, how, and when messages are relayed on the fireground. Once again while there are no specific incidents which have lead to firefighter injury or death due to poor fireground communications, there have been discussions amongst the various fire agencies regarding the need for standardized communications procedures.

Numerous reports and articles have been written regarding how fireground communications have contributed to injuries or deaths on the fireground. Inconsistent fireground communications and the lack of a standard operating guideline for fireground communications increase the potential danger for the citizens and fire personnel. Ignoring the potential dangers of inconsistent communications and consequently not addressing the issue through a standard operating guideline leaves all departments vulnerable in the future. The possibility of firefighter or civilian injury and/or death becomes greater as time passes. There is also a potential increase in civil or criminal liability if a disaster occurs due to a lack of effective communications.

The National Institute for Occupational Safety and Health (NIOSH 2008) developed a report outlining the causal factors of firefighter fatalities. In this report poor communications and the lack of adequate standard operating guidelines are identified as two of the leading factors contributing to firefighter deaths. The report outlines the deaths of three firefighters, which in part, were caused by poor communications between mutual-aid companies. The NIOSH report emphasizes the need to improve emergency communications and adopt standard operating

One of the primary objectives covered in the Execute Leadership (EL) course conducted at the National Fire Academy (NFA) is the concept of adaptive leadership. The EL course specifically references Heifetz, Grashow, and Linsky (2009) when considering adaptive leadership. Adaptive leadership, according to Heifetz, Grashow, and Linsky, entails using leadership to create a change of opinions or hearts of individuals. Adaptive change is not typically a technical problem, but rather an interpersonal challenge. In the EL manual one example of overcoming an adaptive problem involves influencing personnel to change standard actions which may be being performed incorrectly. Fireground communications can be an example of standardized behavior which may not be performed correctly or as well as could be performed.

The development of a county-wide fireground communications standard operating guideline can be described as an adaptive problem. The research conducted is based on improving human factors as it relates to problems identified during fireground communications. Convincing fire personnel to change their methods of operating often involves changing hearts
and minds; creating this change is by its very nature, an adaptive process. A second component of the research, creating a county-wide standard operating guideline, can also be construed as an adaptive issue. When creating a standard operating guideline, which applies to multiple fire departments, a change in operations must occur within some or all of the involved departments, requiring a give and take amongst the personnel. Some personnel will most likely feel the way their department is currently operating is the correct way to function. An adaptive change may be required to influence departments and personnel to operate in a more uniform manner.

The creation of a fireground communications standard operating guideline for Erie County can be tied to multiple goals of the United States Fire Administration (USFA); however, a fireground communications standard operating guideline is most directly correlated to the first goal of the USFA. The first goal of the USFA is to “reduce risk and increase resiliency through programs and training in preparedness, prevention and mitigation” (retrieved in 2015). Creating a fireground communications standard operating guideline has the potential to increase interoperability amongst the Erie County fire personnel, thereby increasing preparedness and also improving the mitigation capabilities of the personnel. The potential improvement in fireground communications, thru the adoption of the standard operating guideline, should help alleviate the chance that critical fireground radio transmissions, such as a mayday, will be missed by emergency scene personnel or dispatch. Decreasing the chance of personnel missing a mayday call or a critical message will also potentially decrease the likelihood of firefighter or civilian injury or death.
**Literature Review**

The literature review was originally initiated with the intent of identifying what others have discovered and written regarding situational awareness for incident commanders on the fireground. A common thread discovered, during the initial review, was fireground communications were a major factor affecting situational awareness. Since fireground communications had been identified as an area of needed improvement with Erie County, the decision was made by this researcher to refocus the research on fireground communications and standard operating guidelines for fireground communications. A variety of sources were utilized to conduct the literature review; technical manuals, standard operating guidelines, journals, online sources, and the United States Fire Administration Library were all used to obtain information.

The research questions were used as a template for obtaining information for the literature review. The literature review was conducted with the intent of identifying what others have written regarding fireground communications barriers, best practices for fireground communications, and recommended components of a fireground communications standard operating guideline. The information obtained aided in development of the research survey submitted to Erie County firefighters.

The initial phase of the literature review focused on barriers to fireground communications. Thiel (1999) reports that much of what has been written and researched regarding communications barriers during emergencies is focused on the technical aspect of communications. Communications hardware, software, and frequencies have been extensively studied. However, the human factor which contributes to fireground communications problems has not been as thoroughly reviewed by researchers. Despite the limited research into the human
factors contributing to fireground communications breakdowns; there are several authors and researchers who so provide some insight on human factors affecting fireground communications.

Hutchins and Timmons (2006) conducted a study on causes of breakdowns in emergency communications. Several of the factors could be directly tied to how messages were sent. Hutchins and Timmons noted that as the message sender became overly excited, so did those receiving the message. The researchers also describe how a few individuals tended to monopolize radio time. Another issue Hutchins and Timmons discuss is how messages with low importance were often relayed, thus impeding the potential transmission of critical messages. In another report by Timmons (2007), Timmons describes how poor policies and training contribute to communications breakdowns. A final factor reported by Timmons is senders often relay information that would be better suited to be relayed in-person.

Thiel (1999) prepared a special report on communications for the USFA. This report provides information regarding human factors affecting fireground communications. Thiel stresses how numerous, non-vital messages may cause issues with messages being received. Thiel’s findings support the research of Hutchins and Timmons (2006). Similarly, Thiel also writes about the use of face-to-face communications in place of over the radio transmissions. Thiel’s premise of face to face communications also reinforces the theories mentioned by Hutchins and Timmons.

Brunacini (1985) describes several factors affecting fireground communications. Brunacini’s writes that poor training on communications, a lack of a communications standard operating guideline, and the way individuals physically communicate a message all affect fireground communications. Brunacini advises an individual’s volume, level of anxiety, terminology used, as well as several other factors all influence how messages are received on the
fireground. These factors sway the ultimate outcome of fireground communications. Thiel (1999), similarly to Brunacini, also reports how volume and several speech patterns can create communications barriers if not performed correctly.

Capoziello (2015) writes about the importance of radio discipline. Similarly to Brunancini and others, Capoziello stresses the importance of speaking calmly and clearly. Capoziello mentions the importance of clarity during transmission, in that the sender needs to specifically identify who the target audience is. Likewise, the message receiver must be clear about what has been transmitted. The message receiver should verify the message by repeating it back to the sender. However, Capoziello also mentions several simple physical acts which can improve communications. One example of physical actions which may improve communications is the location where the microphone is held and how the sender’s body is positioned in relation to background noise.

There are other dynamics which affect fireground communications. Dunn (2006) and Gasaway (2013) both stress the importance of limiting radio traffic to essential information. Too much radio traffic can quickly overwhelm the message receiver, which is often the incident commander. A high volume of radio traffic amplifies the possibility of critical traffic being missed, which may affect the decisions made by the incident commander. Gasaway does, however, mention the opposite of too much radio traffic can also occur; sometimes essential radio traffic is not transmitted. Gasaway describes how personnel may feel intimidated to not transmit an important message out of fear of punishment or ridicule by peers or superiors. A final factor affecting communications, as discussed by Gassaway, is the use of radio channels. Although this can be construed as a technical issue, the decision on which radio channels to use is still a human decision. Gasaway debates the use of a single channel versus multiple channels
on the fireground. While Gassaway finds merits in both methods, ultimately Gassaway stresses the number of channels used is less important than the having multiple people available to monitor radio traffic. Gassaway feels it is too difficult for one person to monitor all the traffic which occurs, especially, on multiple radio channels.

The second phase of the literature review was conducted with the intent of identifying what others have written with regards to fireground communications best practices. Multiple authors and researchers provide information, tactics, and procedures for improving fireground communications. The best practices including such items as training, radio channel selection, use of personnel to monitor traffic, face to face communications, structured radio reports, and procedures to identify critical radio traffic.

Several authors emphasize the importance on training to improve fireground communications. Frederick and Tuominen (2010) describe radio communications as it relates to wildland firefighting. The authors point out training on radio communications prior to an emergency event occurring allows crews to establish a uniform protocol for radio traffic which the crews inherently self-monitor and regulate. The authors also describe how training affects firefighters’ ability to more efficiently relay information, adding that repetition helps increase proficiency. Dugan (2009), while discussing the importance of communications on situational awareness, also emphasizes training on radio communications to build proficiency. Dugan (2009), Brunacini (1985), Timmons (2007), and Frederick and Tuominen (2010) all believe listening to tapes of radio traffic, along with discussing communications during after action reviews, will help firefighters’ identify both inadequate and reliable radio communication behaviors. The International Association of Fire Chiefs (IAFC) released a presentation on best practices for radio communications in 2008. One of the recommendations in the presentation is
the need for continuous radio communications training throughout a firefighter’s career. NFPA 1221 calls for the communications operational guideline to be reviewed annually by all personnel covered by the guideline (2016 Edition).

The literature review revealed heavy support for radio channel selection as a best practice for fireground communications. While there is some support for the use of multiple channels on the fireground, Dunn (2006), the majority of the authors identified in the literature review supported either single channel use, or a single channel separate from dispatch. Varone (2003) offers several recommendations for radio channel use during emergencies. First, Varone supports the use of a single channel for all fireground operations. Varone feels the use of a single channel limits helps reduce the possibility of personnel missing critical radio traffic. Varone goes on to support the idea the fireground channel should not be on the same channel as dispatch. Varone believes dispatch on a separate channel from fireground operations will help reduce the likelihood of key fireground messages from being missed. Thiel (1999), Lasky (1998), Sendelbach (2003), and Bingham (1997) all support the idea of dispatch being on a separate channel than the fireground operations. All of these fire service leaders stress the importance of fireground operational communications being on a separate channel from dispatch in order to prevent overtaxing of the incident commander and help reduce the chances of interference of critical traffic.

Another best practice identified during the literature review is the need for the incident commander to have assistance monitoring radio traffic. As an incident grows and radio traffic increases, the demands on the incident commander also increase. Lasky (1998) offers several options to assist command, including: a command aide, a command advisor, or a communications officer. Thiel (1999) supports the use of a command aide to help monitor radio
traffic. Varone (2003) supports the idea of a command aide as well, but he also advises the best way to help command with monitoring traffic is for dispatch to assist. Brunancini (1985), on the other hand, goes so far as to say the entire command post and command staff should assist the incident commander with monitoring fireground communications. Dunn (2006), contrarily, strongly supports the assignment of a communications officer. NFPA 1221 (2016 Edition) also recommends a communications officer should be designated on all large-scale events.

One of the principles identified during the literature review was the need for more face to face communication on the fireground. Thiel (1999), Varone (2012), Brunacini (1985), and Timmons (2007) all support an increased use of face to face communications; specifically, the authors recommend face to face communications by personnel in the same sector or division of an event. Bingham (1997) further develops the idea of who should communicate with each other. Specifically, Bingham advises the incident commander should communicate to sector leaders, and sector leaders should communicate to crew leaders. Bingham believes the practice of selective communication is beneficial to the chain of command and should reduce the incident commander’s span of control with respect to communications monitoring.

Two more factors for effective fireground communications discovered in the literature review were the use of consistent terminology used by firefighters, and a method to identify critical messages. Numerous authors describe the need for firefighters to utilize the same terminology in order to avoid confusion on the fireground. Common terminology is also mentioned in NFPA 1221 (2016 Edition). Timmons, in his 2007 report on interoperability, writes about the elimination of the use of codes during emergencies. Timmons mentions how the use of codes can cause confusion amongst different departments. Thiel (1999) recommends the same specific words should be utilized by personnel during an emergency. Tippett (2014)
proposes the “Three C’s” for fireground communications; these are “clear, concise and complete.” Tippett advises it is essential for personnel to use words everyone on the fire scene knows. Stumbaugh (2008) stresses the importance of common terminology during incidents involving multiple departments. Hughes (2014) carries the philosophy of common terminology even further than the other authors by calling for a “national standard for fire service terminology.” Hughes feels such a standard would greatly improve multi-jurisdictional operations.

While multiple methods to identify critical radio traffic were discovered during the literature review, ultimately, some variation of the words “emergency, urgent, and priority” were preferred. The authors also extensively mention the use of “mayday”; however, Erie County already has a mayday policy in place, therefore the literature review focused more on the other critical identifiers. During their study on radio interoperability, Hutchins and Timmons (2006) reviewed emergency scene radio transcripts. Hutchins and Timmons found the use of critical message identifiers such as emergency, priority, and urgent resulted in the messages being missed less often than other messages. Thompson (2012) emphasizes the use of “urgent, priority, and normal”. Bingham (1997), conversely, writes that most departments use a single word, such as “emergency” or “priority”, to identify all critical traffic. Thiel (1999) proposes the idea of a “tiered message priority”. Thiel suggests different words should be used based the level of importance of the message being sent.

Similar to terminology and message identifiers, many authors also identified structured radio reports as a best practice. Structured radio reports were recommended for size-up, progress reports, and benchmarks. While numerous methods of size-up are available, the authors all identified the need for a structured, routine method of reporting size-up. Thiel (1999), Brunacini
(1985), Dunn (2006), and Avillo (2002) all stress the importance of structured size-up or initial reports by command. Avillo actually declares the initial report “must have definite structure to be of any use to responding personnel (p. 28)”.

The literature review revealed a variety of means to provide structured progress reports. Several acronyms were identified as a way of maintaining a common structure of reporting, while at the same time offering a method for personnel to remember what information to provide over the radio. Stumbaugh (2008) proposes the "OCAA" acronym, which stands for object, condition, action, assignment. In his article on fireground operations, Emery (2007) advocates "PACT" for progress reports. PACT is comprised of progress, air, conditions, and team number. Avillo proposes "CAR", which stands for conditions, action, and resources. Capoziello (2015) advocates the "LUNAR" or "UCAN" acronyms. LUNAR stands for location, unit name assignment/air, while UCAN indicates unit, conditions, action needs. While the authors, as a group, don't advocate a specific pneumonic for progress reports, it is clear the authors do support the idea some form of structured progress reports is needed. It is important to note that Dunn (2006) and Timmons (2007) also advocate the use of a time parameter to determine when progress reports are given, both from command and operating crews.

Prziborowski (2015) and Coleman (2008) both write about the need for structured benchmarks. The benchmarks are utilized to identify key fireground tasks which have been completed. These tasks are announced over the radio so all personnel know what objectives have been completed, as well as a means for incident documentation. Prziborowski emphasizes the use of over the air benchmarks as a means to limit liability with potential litigation. Coleman, though, notes benchmarks inform command of job completion, provide a timeline for the incident in case of litigation, and also allow command to determine the evolution of a given
emergency event. Coleman stresses it is not necessary to use all of the benchmarks, but more importantly, it is necessary for the benchmarks to be standardized.

The final phase of the literature review identified what others recommend with respect to fireground communications standard operating guidelines. Brunancini (1985) notes one of the main causes of fireground communications problems is a deficiency in a communications standard operating guideline. The National Fire Protection Association (NFPA) 1561: Standard on Emergency Services Incident Management recommends all departments have a communications standard operating guideline, and specifically recommends the use of the terms “emergency traffic” and “mayday” (2014 Edition). The United States Fire Administration (USFA 1996) developed a manual on risk management, with one of the recommendations from the manual being a communications protocol. The USFA risk management manual proposes the use of an emergency traffic designator and use of a tactical radio channel. The USFA (1999) also developed a technical manual for developing standard operating guidelines. In this manual, the USFA recommends the creation of a communications guideline, including components on emergency traffic, radio channels, and progress reports. The International Association of Fire Chiefs (IAFC 2008) and Thiel (1999) also support the implementation of a standard operating guideline for fireground communications. Similarly to the USFA’s recommendation, Thiel calls for the emergency traffic to be included in the guideline. Terpak and Viscuso (2011) created a textbook specifically for fire service guidelines. Two of the guidelines recommended by Terpak and Viscuso are guidelines for a mayday and for critical radio traffic.

Multiple fireground communications procedures of other fire departments, which could be retrieved from on-line sources, were also reviewed to identify what is currently being
included in communications guidelines. Guidelines from the following entities were reviewed: Lorain County, Glendale Fire Department (FD), Novato FD, Sam Bass FD, Galena FD, Sierra Vista FD, Upper Allen FD, Ponderosa Volunteer FD, and the Phoenix FD. With the exception of Lorain County, all of the other guidelines were able to be retrieved from firefighterclosecalls.com. The majority of the department guidelines reviewed includes some form of critical traffic identifier. Multiple departments also include definitions or common terminology, size-up, and progress reports in their guidelines. Many guidelines also include recommendations on how to speak on the radio, what information should be included, and channel selection.

The literature review provided helped accomplish two things with respect to the research. First, the literature provided background information to consider with respect to the research questions. While the literature does not answer the research questions, the information in the literature review does provide some reference material to compare and contrast against the original research obtained. Secondly, the literature review helped to guide the questions asked in the survey distributed to the Erie County firefighters. The literature review identified a number of barriers and best practices in fireground communications. This information was used to develop questions which ultimately asked the respondents to identify which barriers occur most frequently in Erie County; as well as what best practices the respondents felt would be beneficial for Erie County. The literature review also helped to identify what other departments include in their respective fireground communications guidelines. The information from the literature review regarding guideline components was used in the survey questions to help identify which components Erie County firefighters would like to see included in an Erie County fireground communications standard operating guideline.
Procedures

Initial research was focused on identifying methods to improve the situational awareness of incident commanders during emergency events. After some preliminary literature review, communications was identified as one of the main factors affecting situational awareness. The decision was made to refocus the research on the development of a fireground communications standard operating guideline for Erie County. Further, the research was geared towards the human side of communications rather than the technical aspect of communications. The research questions were developed; the questions sought to identify communications barriers, communications best practices, and components for a communications standard operating guideline. The action research method was utilized with the intent of developing a fireground communications standard operating guideline for Erie County.

A literature review was conducted thru use of the USFA library, several internet search engines, on-line sources, research databases, and review of various published journals and text books. The information found in the literature review lead to the development of a survey, with the intent of the survey being to conduct original research. The determination was made to utilize all Erie County firefighters as the target audience of the survey. There are approximately four hundred firefighters in Erie County. This researcher believes this group of firefighters would provide an adequate population with which to obtain sufficient original data.

The survey was developed using the internet-based company SurveyMonkey®. Standard multiple choice, single answer and multiple answer questions were used. Some questions also provided the respondent with an option to provide additional comments. A link to the survey was created and distributed through department email to all Perkins Township Fire Department personnel. A second email was sent to the Erie County Fire Chiefs with a request that each fire
chief forward the email to the personnel of each Chief’s respective fire department. The survey was sent in early October, with a collection date approximately two weeks later.

The survey data was collected thru SurveyMonkey and converted into a format which could be included in the final research report. The information from the data was also tabulated using SurveyMonkey features. The information obtained, along with material obtained in the literature review, was used to develop a fireground communications standard operating guideline for Erie County.

There were several limitations identified during the research process. First, although the survey developed was influenced by the literature review and the need to answer the research questions, the survey is naturally biased by the opinion’s and views of this researcher. The questions asked and how they are phrased may lead the respondents towards specific answers.

A second limitation is the potential biases of the respondents. Respondents may be inclined to answer questions based upon a desire to maintain status quo, or to maintain individual departmental autonomy.

A third limitation was a survey format error which occurred during the use of SurveyMonkey. This researcher inadvertently enabled a program feature which prevented multiple respondents from utilizing the same computer device. For example, initially only one firefighter could use a department computer to respond to the survey. This error was discovered and corrected, but it is unknown how many respondents were unable to complete the survey prior to the correction.

A fourth limitation was discovered regarding the survey distribution process. A letter was sent to the fire chiefs of Erie County with a request to forward the survey to all respective department personnel. It is not able to be determined how many chiefs actually forwarded the
request. It also must be taken into consideration that not all fire chiefs have access to an email for all personnel. Therefore, this researcher cannot verify how many people actually received the survey.

The final limitation noted is the number of responses received for the survey. As previously stated, there are approximately four hundred firefighters in Erie County. Only forty-one surveys were submitted for review indicating a response rate of about ten percent. While a ten-percent return is not statistically sufficient to claim the responses given are indicative of the majority of Erie County firefighters’ opinions, the responses do provide a basis with which to make informed recommendations for the fireground communications standard operating guideline.

Results

The survey which was developed was distributed with the intent of answering the three research questions. The survey was distributed to Erie County firefighters through email. The intent of the first four questions of the survey was simply to obtain some background information regarding the departments of the respondents. Questions five thru seven attempted to answer the first research question by identifying fireground communications barriers as perceived by Erie County firefighters. Questions eight thru twenty-one asked the firefighters to identify fireground communications best practices, thus addressing the second research question. The final research question is the focus of survey questions twenty-two thru twenty-nine, which asked the firefighters to choose what components should be included in an Erie County fireground communications standard operating guideline. The last survey question allowed the firefighters to provide any additional information he or she felt was pertinent to fireground communications.
For the purpose of brevity, all percentages given by the respondents will be rounded to the nearest tenth of a percent.

There are thirteen fire departments operating in Erie County. Personnel from eleven of the departments responded to the survey request. While the information obtained cannot be said to be indicative of all of the departments in Erie County, the majority of the departments are represented by the responses given in the survey results. One of the departments which did not have any personnel respond to the survey is located on an island; this department does not regularly provide or receive mutual aid from the rest of the county. The other department, which is not represented in the survey results, lies jurisdictionally between Erie County and an adjacent county; this department primarily responds with the adjacent county.

The first four questions of the survey provided some background information on the departments whose personnel responded to the survey. Based on question one, there are approximately four hundred firefighters in Erie County. The information from question two was used to estimate there are seventy-five fire department officers in Erie County. Based on question three, given eleven out of thirteen departments are represented, seven of the departments provide radios to all personnel on the fireground. Four departments do not provide radios to all personnel on the fireground. The final background question simply requested contact information for the respondent in the event any follow-up information was needed by this researcher based upon the respondent’s answers.

Questions five through seven attempted to identify barriers to fireground communications as experienced by Erie County firefighters. The questions asked respondents to select communications barriers from several different viewpoints. Question five looks at barriers from
the viewpoint of the message receiver, while question six looks at barriers from the sender’s viewpoint. Question seven looks at the barrier issue from a procedural standpoint.

Question five asked for barriers identified by individuals when receiving communication messages. The greatest number of respondents, 75.6%, felt background noise is a barrier when receiving messages. Fifty-six percent of the respondents felt personnel speaking too quickly and too much radio traffic were also barriers. Several “other” responses were provided; however, the responses primarily repeated the answer choices which were provided. The full response for question five is displayed in Graph 1.

![Graph 1: Barriers of the Receiver](image)

Question six requested the respondents to categorize barriers which have been found when sending radio transmissions. Similarly to question five, the greatest number of respondents identified background noise as a barrier when sending messages. Background noise was followed closely by messages being covered by non-essential radio traffic. As in question five,
the “other” responses for question six mostly repeated the answer choices for the question. The full response to question six is displayed in Graph 2.

![Graph 2: Barriers of the Sender](image)

Question seven looks for message format and processes which Erie County firefighters believe are barriers to effective fireground communications. Two factors were identified by over fifty percent of the respondents as barriers to fireground communications, inconsistent size-ups and inconsistent benchmarks. Fifty percent of the respondents felt contradictory terminology was a barrier. The “other” responses identified inconsistency amongst departments and personnel as barriers to fireground communications. The full response to question seven is displayed in Graph 3.
Graph 3: Format/Process Barriers

Questions eight thru twenty-one ascertain what Erie County firefighters believe to be radio communications best practices. These questions focused on such topics as radio channel selection, assisting command with monitoring communications, critical radio messages, message formats, and what reports should be announced over the radio versus provided face to face. The questions looked at some of these components from multiple views.

Question eight asked the respondents to identify what radio channel should be selected during multi-department emergencies. The greatest number of respondents, 42.5%, felt the County Fire channel should be used at the discretion of the incident commander. 30.0% of the respondents felt dispatch should direct departments to operate on the County Fire channel on every confirmed active fire incident. Less than twenty percent of the respondents indicated operations should stay on the channel of the department where the incident is occurring. The “other” responses primarily indicated how the County Fire channel could be used for specific sectors during an incident.
Questions nine thru eleven of the survey considered the idea of assisting the incident commander with monitoring fireground communications. Question nine specifically asked if the respondents felt it would be beneficial for command to receive assistance with monitoring communications. Ninety-five percent of the respondents felt assisting command would be beneficial. Question ten followed this by asking the respondents who should assist command: the safety officer, a command aide or advisor, or a communications officer. While the responses were fairly evenly split, 62.5% of the respondents indicated a communications officer should be assigned to assist command with communications. Question eleven asked how the assistant should be assigned. The greatest number of respondents, fifty percent, felt a communications assistant should be assigned at the discretion of the incident commander.

Questions twelve thru fourteen dealt with critical radio traffic. Question twelve asked the respondents if an identifier was necessary to distinguish critical messages. Over ninety-percent of the respondents favored the use of a critical message identifier. Question thirteen asked the respondents to indicate what term should precede critical traffic. The greatest number of respondents, 45.0%, felt “Emergency Traffic” should be used. While only 30.0% selected “Priority Traffic” and 15.0% preferred “Urgent Traffic”. Question fourteen asked the respondents to identify what factors or fireground events should be identified as critical traffic. Approximately ninety percent of the respondents selected “structural instability”, “need for evacuation”, and “immediate danger to life or health” as critical messages. Several other answer choices were also selected by over half of the respondents. A mayday was also identified as a critical message in the “other” responses; however, Erie County already has a standard operating guideline for a mayday event. The full results for question fourteen are displayed in Graph 4.
Question fifteen asked the respondents for the order which messages should be conveyed by the message sender. The respondents were provided two main options: either “hey you, it’s me” or “it’s me, hey you”. The responses were fairly evenly split between the two options, with 30.8% preferring “hey you, it’s me” and 43.6% preferring “it’s me, hey you”. Additionally, 17.9% didn’t prefer one method or the other just as long as one of the methods was used. The other comments also indicated a lack of preference.

Questions sixteen and seventeen of the survey considered options for progress reports. In question sixteen the respondents were asked to identify the preferred method, or acronym, for providing progress reports. Several options were provided such as: UCAN, LUNAR, PACT, and who, what, where. Fifty percent of the respondents preferred the UCAN report which stands
for unit, conditions, actions, and needs. Question seventeen followed up by asking when progress reports should be given. The respondents preferred “as requested by the incident commander” and “as tasks are complete”, 55.0% and 77.5% respectively. Several “other” comments were provided; however, the comments did not support any other specific theory.

Question eighteen asked respondents to select which incident benchmarks should be announced over the radio. An extensive list of options was available, with the respondents supporting the use of nearly all of the benchmarks. Several benchmarks, such as extension, overhaul, salvage, and exposure, were not supported. The full results are displayed in Graph 5.

![Graph 5: Benchmarks](image)

Question nineteen asked the respondents to determine when communications should be conducted face to face versus over the radio. Multiple options were provided and multiple
answers could be selected. Ninety-five percent of the respondents supported the transfer of command being conducted face to face; however, this option would also be announced over the radio. The respondents also supported face to face communications for crews operating on the same division, seventy-five percent, and crews operating on the same side of the exterior of a structure, 67.5%.

Question twenty asked respondents to identify how personnel should confirm receipt of a message on the fireground. The respondents were given the options of stating “clear”, providing a unit identifier and stating “clear”, or giving a unit identifier, repeating the given message, and then stating “clear”. The majority of respondents, 55.0%, preferred the unit identifier along with repeating the message and advising clear. One respondent offered the “other” response and reported “Clear”, “ok” or “message received” were all adequate.

Question twenty-one was the final question to focus on best practices for fireground communications. The respondents were asked to identify additional information to the size-up which should be given during the initial radio report. More than fifty percent of the respondents indicated a “command identifier”, “offensive versus defensive strategy”, “additional resources needed”, “initial actions being taken”, and “special hazards” should be included in the size-up. Nearly half of the respondents, 45.0%, also indicated the “command post location” should be included. Only 22.5% of the respondents felt the “presence of a basement” in the structure should be included in the size-up report.

Questions twenty-two thru twenty-nine of the survey asked the respondents to identify specific components to be included in the fireground communications standard operating guideline. Interestingly the majority of the respondents felt all of the components should be included in a fireground communications standard operating guideline. The respondents were
given a yes or no option for each component. The graph represents the total percentage yes and
no votes for each component. The respondents were asked to determine if recommendations for
the following components should be included in a fireground communications guideline:
communications training, face to face communications, size-up information, radio channel
selection, progress reports, critical transmissions, and sending/confirming radio transmissions.
The results of questions twenty-two thru twenty-nine are displayed in Graph 6. Question twenty-
eight essentially repeated question twenty-three and, since the results of the two questions were
nearly identical, was not included in Graph 6.

![Graph 6 – Standard Operating Guideline Components](image)

The final survey question allowed the respondents to provide additional information
regarding a fireground communications standard operating guideline. Eight of the respondents
provided additional information. One respondent expressed an opinion regarding the format for
sending radio transmissions. Two respondents advocated communications uniformity amongst
the Erie County fire departments. One respondent requested the proposed communications guideline be used during Erie County joint training sessions. Two respondents made comments regarding radio channel selection, with one respondent preferring use of a simplex channel on incidents and the other respondent preferring use of multiple channels. One other respondent simply responded “Marx radios”. The full responses to survey question thirty, as well as the full results of the rest of the survey, can be found in Appendix B.

**Discussion**

The literature review was completed to identify what others have written or discovered regarding fireground communications barriers, best practices, and fireground communications standard operating guidelines. The original research was conducted with the intent of further clarifying and building upon the information obtained from the literature review. The survey developed was used determine what Erie County firefighters have identified as barriers to effective fireground communications, best practices for communications, and what the firefighters feel should be included in a standard operating guideline for fireground communications. The discussion includes how the original research compares to the literature review, this researcher’s analysis of the information, and the implications of how the information obtained will affect the departments operating in Erie County. The discussion information will be reviewed within the context of the research questions.

The literature review revealed a variety of fireground communications barriers. The initial component of the original research identified which barriers have affected fireground communications according to Erie County firefighters. The firefighters indicated messages being sent to quickly or quietly as barriers to communications. Hutchins and Timmons (2006),
Brunacini (1985), and Capoziello (2015) all write about how message senders must speak calmly and in a normal tone, without becoming overly excited during radio transmissions. The authors’ information is supported by the results of the survey in this regard. Interestingly, correcting the problem of how personnel speak on the radio would seem to be a training issue. While, Timmons (2007) and Brunacini (1985) feel poor training affects communications, the survey results did not support lack of training as a communications barrier. In fact, not one respondent indicated they felt they weren’t trained properly to communicate on the radio. Yet, 75% of the respondents felt a fireground communications guideline should include a training component.

While Erie County firefighters don’t feel improperly trained to communicate on the radio, it does seem training is an issue that needs to be addressed in the future.

Two more barriers identified by the survey results were messages being interrupted either by non-essential radio traffic or by background noise. Hutchins and Timmons (2006), Thiel (1999), Dunn (2006), and Gasaway (2013) all support the results by emphasizing the need to minimize radio traffic, and specifically try to limit transmissions to critical information. Capoziello (2015) identifies background noise as a factor and how the noise can be minimized by proper body positioning. The issue of minimizing non-essential traffic can be addressed in two ways. First, by training personnel on what is essential fireground information, non-essential traffic can be reduced. Second, having a communications guideline will also help personnel identify essential information. With respect to background noise, the path to correcting this problem seems to be primarily a training issue. Personnel must be trained on how body positioning and radio features can help minimize noise affecting radio transmissions.

The final barrier identified by the research results is the lack of structured radio reports, which includes size-ups, benchmarks, and terminology use. While multiple authors support
structured size-up reports, Avillo (2002) stresses the initial radio report must be specific in order to benefit fireground personnel. The respondents agreed consistent size-ups were necessary. The respondents also identified specific information which should be included in the size-up. The size-up content identified by the respondents occurred during the best practices section of the original survey. Coleman (2008) and Prziborowski (2015) are supported by the survey results which indicated a need for structured benchmarks. The authors describe how benchmarks serve to create an incident timeline and help command determine incident evolution. The results signifying the need for common fireground terminology also support information identified in the literature review. Thiel (1999), Tippett (2014), Hughes (2014) and Stumbaugh (2008) all declare the need for common terminology and plain language use.

While not supported by the majority of respondents, nearly half of the respondents also identified inconsistent progress reports and a lack of face to face communications as barriers to communications. Yet, the respondents did indicate face to face communications and structured progress reports should be included in the communications guideline. Face to face reports are supported by Thiel (1999), Varone (2012), Brunacini (1985), and Timmons (2007). In the best practices section of the survey, respondents identified several criteria for when face to face communications should occur. Stumbaugh (2008), Emery (2007), and Capoziello, meanwhile, declare the need for structured progress reports, and similar to the face to face communications, the respondents identified components for progress reports in the best practices section of the survey.

The comparison of the original research and the literature review with respect to fireground communications barriers was very informative. The majority of the literature review was supported by the data derived from the original research. From the comparison, this
researcher has determined that personnel operating on incidents in Erie County have experienced many of the same communications problems identified by other researchers and authors. Moving forward, if these deficiencies are not addressed through training and common procedures amongst departments in Erie County, then the potential danger to firefighters due to poor communications, will not be reduced.

One way to address many of the communications barriers identified is through the use of communications best practices. The next section of the original research focused on what Erie County firefighters considered best practices for fireground communications. While correcting some of the previously identified barriers could be parlayed into generalized best practices, the original research looked more specifically at explicit actions which could be beneficial to fireground communications. The intent of the original research was to compare the best practices identified by Erie County firefighters to those identified in the literature review.

One component to improve fireground communications identified in the literature review was the idea of monitoring radio traffic. The authors identified the need to operate on a single channel different than the dispatch channel in order to minimize the amount of traffic on the fireground channel. Varone indicated this was necessary to reduce the likelihood of critical traffic being missed or covered by other radio traffic. This theory if further supported by Thiel (1999), Lasky (1998), Sendelbach (2003) and Bingham (1997). The survey respondents supported using the County Fire channel at the discretion of the incident commander. The literature and research agree on the need to move fireground communications off of the dispatch channel. This could prove to be a challenge in the future, as it has been the norm for departments to operate on their specific department channel. However, the development of a county dispatch center should assist with the use of the County Fire channel.
Another best practice identified in the literature review is the use of a second person to help the incident commander monitor radio communications. Several different options were backed by the literature review. NFPA 1221 (2016 Edition) calls for a communications officer to be utilized to monitor radio traffic. Thiel (1999) proposes a command aide, while Dunn (2006) supported a communications officer. The respondents agreed with Dunn and preferred the communications officer. The respondents also supported the communications officer to be appointed at the discretion of the incident commander. Discussions have begun within Erie County regarding the implementation of incident management teams at larger structure fires. It would seem a communications officer could be included as a component of an incident management team.

The next best practice identified during the literature review was the use of certain terms to signify critical information which needs to be transmitted over the radio. This information does not include a mayday, but is significant enough that all other radio traffic should cease. The information may be vital to the incident commander or all personnel on the fireground. In the study completed by Hutchins and Timmons (2006), the authors reported messages preceded by critical traffic identifiers were missed less often by incident commanders. The survey results supported the use of “emergency traffic” prior to critical messages. The survey also asked respondents to signify which criteria should be used to designate a critical message. By identifying criteria or parameters for the critical identifier to be used, overuse by personnel should be reduced. Often, personnel believe their traffic is critical, when in fact in may not be. Moving forward there will need to be conducted to ensure personnel are familiar with what messages should be deemed “emergency traffic,” based upon the results of the survey.
The literature review identified the need for structured progress reports as a best practice. While the survey results did not indicate respondents did not feel structured progress reports were a barrier to fireground communications, the respondents did indicate structured progress reports should be used in the form of a “UCAN” report. The “UCAN” report was supported by Capoziello (2015). While others in the literature review supported other types of progress reports, the authors overwhelmingly felt some type of structured progress report was necessary. Currently, Erie County firefighters use the “LUNAR” report for mayday conditions; however, the “UCAN” was favored for progress reports. The firefighters will need instruction and training on differentiating the two reports and the respective reports purposes.

Similarly to progress reports, benchmarks were also shown to be a best practice. While benchmarks are similar to progress reports, benchmarks are provided based upon completion of specific tasks. Prziborowski (2015) and Coleman (2008) are proponents of the use of benchmarks. Coleman, in his book on incident command, compiles an extensive list of fireground benchmarks. While the respondents supported the use of benchmarks, not all of Coleman’s recommendations were supported. The respondents did not support the use of benchmarks for: extension, overhaul, salvage, and protecting exposures. This researcher tends to back the respondents in this regard. While benchmarks are critical, overuse of benchmarks can have the unwanted effect of monopolizing radio time. While benchmarks are currently used in Erie County, their use is somewhat inconsistent. Reinforcement of the use of benchmarks will be required to maintain efficient fireground progression.

The final best practice identified during the literature review was the need for direction on how messages are received and cleared. Capoziella (2015), specifically, mentions the need for the message receiver to repeat the message back to the sender to help verify accurate
comprehension. The respondents supported Capoziella in this regard. The respondents backed the idea of repeating the message versus simply responding “clear” when a message is received. On the surface, the idea of repeating a message would seem counterintuitive to reducing unnecessary radio traffic; however, by having the message receive repeating the sent message, the sender is able to verify the message was fully understood and heard. Message comprehension is critical for efficient fireground communications and operations. Convincing personnel to adopt the repeat format may require some adaptive leadership.

Multiple authors and organizations support the creation and adoption of a fireground communications standard operating guideline. While some information is provided regarding the content of such a guideline, more often than not there is simply a statement from the author or group suggesting the need for the guideline. NFPA 1561 (2014 Edition) recommends adoption of a guideline, including the use of the term “emergency traffic.” However, there is very little additional information suggested for the guideline content. The USFA (1996) risk management manual also recommends a guideline, but falls short of suggesting content for the guideline. In contrast, the USFA (1999) report on how to create standard operating guidelines suggests a communications guideline should include content on emergency traffic, radio channels, and progress reports.

In order to clarify guideline content, the communications guidelines for multiple departments were reviewed, but again, there was no real consistency amongst the guidelines as far as content. The only semi-consistent content was the recommended use of a term to identify critical radio traffic. The survey included many of the components found amongst the varying department guidelines, as options for the Erie County firefighters to choose for the Erie County communications guideline. What was interesting was that the respondents indicated all of the
options provided should be included in the guideline. The fact the respondents preferred all of
the options be included in the guideline, seems to indicate the respondents feel a fireground
communications guideline should be fairly extensive and obviously needed. The implementation
of such an extensive county guideline may be a challenge, as in the past there has been a push to
keep all county guidelines extremely concise.

Overall, the original research appears to support the findings from the literature review.
The literature review identified barriers to fireground communications, multiple best practices
for communications, and several recommendations for content of a communications guideline.
The original research built on the literature review to identify specific content for an Erie County
fireground communications standard operating guideline. The information obtained from the
literature review and the original research was utilized to provide the recommendations which
follow.

Recommendations

The purpose of this applied research was to develop a fireground communications
standard operating guideline for Erie County. The information obtained from the literature
review and original research has enabled this researcher to successfully accomplish the goal of
developing the guideline. Along with the creation of the guideline this researcher has several
recommendations.

The first recommendation is all of the components identified in questions twenty-two thru
twenty-nine of the survey should be included in the fireground communications guideline for
Erie County. The respondents overwhelmingly supported all of the components from the survey
being included in the guideline in some form or another. Those components included
recommendations for communications training, face to face communications, size-up information, radio channel selection, progress reports, critical transmissions, and sending/confirming radio transmissions.

The second recommendation is the sample fireground communications standard operating guideline, as included in Appendix A, should be provided to the Erie County Standard Operating Guidelines Committee for further review. After review by the committee, the fireground communications guideline should be submitted to the Erie County Fire Chiefs’ Association for a final review and adoption. The adoption of this guideline should occur within three months of the completion of this applied research.

The third recommendation is all fire personnel and the dispatch center should be trained on the Erie County fireground communications standard operating guideline within sixty days of the guideline’s adoption. The timeline for training allows for the distribution of the guideline to all agencies, and consideration for the fact some of the volunteer departments conduct training on a monthly basis. Providing training for personnel should reduce any confusion regarding the intent and implementation of the guideline.

A fourth recommendation is further research should be considered on how to adopt or modify the policy to fit into an all-hazards response in Erie County. The intent of the policy is to improve communications on the fireground. While many of the principles of the standard operating guideline should apply during an all-hazards event, further review should be considered to ensure no further changes will be needed.

A final recommendation is additional research should be conducted to consider the technical aspect of radio communications. As mentioned, the technical side of communications has seen some improvement following the advent of a county-based dispatch system. In the past
each entity operated its own dispatch center, with its own set of communications practices. Since dispatch duties have been taken over by the Erie County Sheriff’s Department, interoperability has improved. However, there has been little review conducted on how to further improve this system and how technical aspects can further improve interoperability and communications. Reviewing, revising, and improving technical and human factors of emergency communications should be a continuous process.
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Appendices

Appendix A: Sample Erie County Fireground Communications Standard Operating Guideline

Purpose
To establish a universal guideline for fireground communications during County or multi-department emergency events. This guideline provides recommendations and best practices for fireground communications.

Scope
This will serve as a guideline for all personnel operating on the fireground or during multi-department emergencies. It shall be the responsibility of each member to review and follow this document.

Action

1. Radio Channel Selection and Monitoring
   a. During multi-department operations the Incident Commander may switch operations to the County Fire Channel
   b. The incident commander is responsible for monitoring fireground traffic as well as additional traffic from dispatch, unless delegated to another person
   c. As an incident escalates, the incident commander should consider establishing a communications officer to assist with monitoring radio traffic
   d. If a communications officer has not been established, the safety officer or a command aide should assist with monitoring communications
2. **Initial Radio Report** – recommendations for information to be included with the initial size-up. Size-up should follow standard information such as COAL TWAS WEALTHS or WALLACE WAS HOT. Additional information to be provided with the size-up during the initial radio report should include:
   a. Command identifier – typically identified by the street name of the occupancy involved or the name of the structure if a commercial occupancy
   b. Offensive vs. Defensive strategy
   c. Initial actions being taken
   d. Special hazards found on arrival
   e. Additional resources needed
   f. Consider command post location if not located in front of the structure

3. **Progress Reports** – progress reports are provided to keep the incident commander updated on current fire conditions and operations.
   a. Progress reports should be provided as tasks are completed or at the request of the incident commander
   b. Progress reports should follow the UCAN format: Unit, Conditions, Actions, and Needs. E.g. Attack “Attack to command, we have heavy fire conditions, we are continuing to attack the fire, we need an additional line on div. 1”

4. **Benchmarks** – benchmarks should be announced over the radio to keep the incident commander informed of operational development and to document key fireground events being completed.
   a. Benchmarks should include the following:
      i. Primary Search All Clear
      ii. Secondary Search All Clear
      iii. Victim Located
      iv. Fire Knocked Down
      v. Ventilation Complete
      vi. Fire Under Control
      vii. Situation Contained
      viii. Back-Up Line in Place
      ix. Command Terminated

5. **Emergency Traffic** – the term “emergency traffic” shall be utilized to signify critical information which needs to be relayed to the incident commander or fireground personnel. This is not to be used in a MAYDAY situation. A request for a MAYDAY should follow the Erie County RIT/MAYDAY standard operating guideline
   b. Command should declare all radio traffic cease to prepare for emergency radio traffic
   c. The personnel providing the emergency traffic will then advise a unit identifier and provide the critical traffic. E.g. “Search has identified explosives in the basement”
d. Command then has the option to repeat the message to all personnel if deemed necessary

e. Examples of information which should be declared as “Emergency Traffic”
   i. Sudden worsening of fire conditions
   ii. Structural instability found; imminent collapse noted
   iii. Victim/occupant located
   iv. Abnormal hazards detected (chemicals, explosives, etc.)
   v. Loss of water
   vi. Need for evacuation identified by interior crews; if evacuation ordered by the incident commander then the Erie County Emergency Evacuation protocol should be followed
   vii. Need to switch from offensive to defensive strategy
   viii. Any other immediate danger to life or health discovered

*Note: Consideration should be given to announcing the presence of a basement in lightweight structures – multiple firefighter deaths have occurred due to structural collapse involving basements and lightweight structural members

6. **Face to Face Recommendations**
   a. When possible messages should be relayed face to face versus over the radio
   b. Transfer of command, followed by an over the radio announcement to all personnel
   c. Crews operating on the interior of a residential structure should communicate face to face when possible
   d. Crews operating on the same division of a commercial occupancy should attempt to communicate face to face when possible
   e. Crews operating on the exterior of a residential structure should attempt to communicate face to face when possible
   f. Crews operating on the same side of a commercial occupancy should attempt to communicate face to face when possible

7. **General Recommendations for Sending/Receiving Radio Transmissions**
   a. Radio operator should speak in a normal to slightly above normal volume
   b. Radio operator should speak at a normal pace
   c. Radio operator should try to position the radio 1 to 2 inches from mouth or mask voice emitter
   d. Radio operator should use body to shield radio from other nearby radios; if possible other radios should be turned down to avoid squelch and/or back feed
   e. When communicating on the fireground, personnel should use common definitions and terminology as per Erie County guidelines for Apparatus Definitions and the Incident Command System
   f. When sending a transmission the sender should follow the “hey you, it’s me” format. E.g. Command to attack
   g. When confirming a message, the receiver should announce their unit identifier (based on task or location), followed by repeated the message
E.g. “Command to div. 1 attack, proceed to div. 2”; “div. 1 attack is clear on moving to div. 2”

h. Radio traffic should be directed through crew leaders or sector leaders whenever possible
i. Radio traffic should be limited to essential information; phrases such as “for your information” are not necessary and use valuable radio time

8. Training Recommendations – training recommendations are provided to help ensure the fireground communications are effectively implemented and followed
   a. All personnel should be trained on fireground communications, beginning during initial orientation and continuing throughout employment
   b. Each department is responsible for ensuring its personnel receive and understand the fireground communications guideline
   c. Fireground communications should be incorporated in department training programs as much as possible; the more often personnel train on communications, the more efficient personnel will become
   d. Multi-department training events should include a fireground communications component if possible
   e. Review of actual radio traffic should be included department training and during after action reviews when possible
   f. Training should include personnel reviewing their own radio traffic. This will allow the firefighter to hear how he/she sounds on the radio and identify potential areas for improvement.
Appendix B – Erie County Firefighters Survey

1. **How many personnel, including full-time, part-time, and volunteer does your department employ?**

   Responses ranged from 16 personnel to 95 personnel.
   • Note – The entity with 95 personnel is an amusement park fire and emergency service which employs a large number of season and part-time personnel.

2. **How many officers, including the fire chief, does your department employ?**

   Responses ranged from 2 to 13 officers.

3. **Does your department provide a radio to all personnel during fireground operations?**

   * Yes 80.5%
   * No 19.5%

4. **Please provide a name, department name, and a method of contact (email or phone) for any follow-up questions or clarification needed based on the answers you provided. (Only your department name will be displayed in the final report).**

   - Margaretta Twp. F.D. 1 Respondent
   - Sandusky F.D. 8 Respondents
   - Perkins Twp. F.D. 14 Respondents
   - Vermilion Twp. F.D. 1 Respondent
   - Huron F.D. 3 Respondents
   - Berlin Twp. F.D. 2 Respondents
   - Milan Twp. F.D. 4 Respondents
   - Groton Twp. F.D. 1 Respondent
   - Florence Twp. F.D. 1 Respondent
   - Cedar Point Fire and EMS 1 Respondent

   *Note: 3 Respondents did not provide any information.
5. **What radio communications barriers have you identified as a message receiver?**
   (Check all that apply)
   * Sender is speaking to quickly 51.2%
   * Sender is speaking to loud 26.8%
   * Sender is speaking to quietly 56.1%
   * Difficult to hear radio traffic due to background noise 75.6%
   * Messages are interrupted by other radio traffic other personnel 43.9%
   * Messages are interrupted y additional calls transmitted by dispatch 34.1%
   * Too much non-essential radio traffic 56.1%
   * Other (please specify) 22.0%

   Other comments:
   - Communication given is often missing critical call information as it pertains to the nature of the call. i.e. number of patients, type of crash. Often there is more detailed given to the responding officers than is given to responding fire units.
   - Back feed, squelching
   - Speaker not speaking clearly
   - When it’s unclear what identification method the message sender is using to identify themselves. Different Officer ID’s depending on which officer it is. For example: Using unit numbers or using actual names.
   - Too many people like to hear themselves talk. If it is possible to deliver a message to the person next to you by talking, you have no reason to use a radio. Only pertinent information should be transmitted to the incident commander or sector leader via radio.
   - Poor reception quality, especially within buildings is another big issue. Too much non-essential radio traffic is not a regular occurrence, and when it occurs it most often happens with specific individuals.
   - Feedback from other radio’s on scene
   - Unable to receive in certain buildings
   - Area where radios are not on talk-around and will not reach our repeater. Our coverage area of the Ohio Turnpike between rout 60 and Baumhart Rd.

6. **What radio communications barriers have you identified as a message sender?**
   (Check all that apply)
   * You feel you have not been trained to operate radios properly 0.0%
   * You feel you have not been trained to effectively convey messages on the radio 5.3%
   * Your messages may be interrupted by non-essential radio traffic 55.3%
   * Your message may be interrupted by additional traffic from Dispatch 44.7%
   * You may be covered by background noise 65.8%
   * Other (please specify) 25.6%
Other comments:
- Not sure if it can be considered a barrier but many times when a call is dispatched we will have communications with multiple dispatchers during the same call
- Sending too much info
- Messages were covered by feedback from radios too close.
- none
- Back feed, squelching
- Especially #3
- I don't transmit many messages on the fireground via radio, but I don't recall having any issues when I have.
- N/A
- There are areas in our eastern district that does not catch the repeater. We need to use the fireground channel in those instances. The repeater is not centrally located.

7. **What message formats and processes have you identified which are barriers to fireground communications? (Check all that apply)**

* Inconsistent terminology used by personnel 50.0%
* No processes to identify critical messages 25.0%
* Type of information given during size-up varies from incident to Incident 57.5%
* Inconsistent transmission of “Benchmarks” 55.0%
* Structure and information given during progress reports are inconsistent 42.5%
* Messages given over the radio which could be given face to face 45.0%
* Other (please specify) 10.0%

Other comments:
- It seems as though each department, or more correctly, individual shifts (officers) have their own idea of how to communicate to their crews. This could create confusion to other responding entities.
- Other than Mayday critical messages are not distinguished
- Inconsistency amongst county departments. The process of contacting dispatch is not consistent for everyone. Is it “Unit xxx to 2200” or “2200 from Unit xxx”? Are we supposed to wait for 2200 to answer before we go on with radio traffic?
- N/A
8. What radio channel do you feel would be the most beneficial during initial operations on a multi-department event?

* Stay on the dispatch frequency of the department where the incident is occurring 17.5%
* Dispatch advises units to switch to County Fire upon confirmation of any working fire (additional fires occurring at the same time would stay on the original channel of the department) 30.0%
* Only switch to the County Fire channel if requested by the IC 42.5%
* Other (please specify) 9.8%

Other comments:
- County fire can be used by the other agencies on scene if directed, IE: water supply, Safety C side, etc..
- Our talk around channel
- Stay on dispatch frequency of IC’s department and use Erie County Channel for Water shuttle type operations
- If we were to utilize the county fire channel, I think it should be used on a consistent basis. It should be assigned on every structure fire. Not just when the IC asks for it.

9. Do you feel it would be beneficial to have a second person assisting the incident commander with monitoring radio communications during county emergencies?

* Yes 95.0%
* No 5.0%

10. Who should assist command with monitoring radio traffic during multi-department operations? (Check all that apply)

* Safety Officer 45.0%
* A Command Aide/Advisor 40.0%
* Communications Officer 62.5%
* Other (please specify) 9.8%

Other Comments:
- Anyone that command deems as competent
- Any officer assigned that task
- I don’t care really what you call the person. I believe that each fire should get a mutual aid engine and also a command staff person. I have regularly assisted mutual aid departments when they have requested an engine as an extra person to assist the IC.
11. If you think a command aide or a communications officer should be used, how should the position be assigned?

* When deemed necessary by the incident commander 50.0%
* During all incidents involving multiple departments 25.0%
* On all confirmed working fires 15.0%
* Other (please specify) 10.0%

Other comments:
- Any time that “span of control” has been reached
- On all working fires. Smaller incidents (rescue) when advised by the IC
  When manpower permits
- Only assist command with critical radio traffic
- No aid

12. Do you feel the announcement of an identifier, such as “emergency traffic”, “urgent traffic”, or “priority traffic” prior to a critical message would be beneficial?

* Yes 92.5%
* No 7.5%

13. What identifier should be used to signify critical radio traffic?

* Emergency Traffic 45.0%
* Urgent Traffic 15.0%
* Priority Traffic 30.0%
* Other (please specify) 9.8%

Other comments:
- I believe people would abuse this to be heard. Also, an emergent/urgent situation is different from person to person
- Unfortunately, the use of any of these terms will be used out of context by certain people. What they consider “emergent, urgent or priority” most certainly would be different from other peoples standards. I feel that the only acceptable radio identifier should be “mayday”.
- I don’t think its needed. Just need to teach a little radio discipline and get the dispatched traffic off the fireground frequency. Obviously a Mayday needs its own SOG for radio traffic.
- Urgent traffic should be used to alert pertinent information to everyone on scene. It is not always emergency traffic, but urgent information that everyone needs to
be aware of. Information such as hidden hazards like holes in the floor or signs of collapse. MAYDAY is its own emergency traffic.

14. If an identifier is to be used for critical traffic, what should be considered critical traffic? (Check all that apply)

* Change in fire conditions 52.5%
* Structural instability 90.0%
* Victim located 57.5%
* Discovery of potential signs of arson 12.5%
* Abnormal hazards located (e.g. Explosives or chemicals) 67.5%
* Resource requests 5.0%
* Loss of water 67.5%
* Need for evacuation 85.0%
* Need to switch from offensive to defensive strategy 57.5%
* Any other immediate danger to life or health 87.5%
* An identifier is not needed 2.5%
* Other (please specify) 10.0%

Other Comments
- Any time that crews either interior or exterior feel that they are facing conditions that would place them in extreme risk of injury or death. We all act as safety officers.
- All of these are certainly critical times during an event. I feel that it is our jobs to identify these conditions, keep the radio traffic to a minimum and listen to what the incident commander, safety officer and sector leaders are communicating.
- Any Mayday situation
- RIT operations, Mayday, and what the IC deems emergency traffic.

15. In what order should messages be conveyed by the message sender?

* “Hey you, it’s me” e.g. “attack from command” 30.8%
* “It’s me, hey you” e.g. “command to attack” 43.6%
* Either of the above methods is acceptable 17.9%
* Other (please specify) 7.7%

Other comments:
- Not sure
- Its me, hey you is what I prefer. It’s what we have naturally done for years. I do think there should be some consistency in the way we talk.
- Either is fine, but if you call out the person you are trying to reach first, then you will grab their attention. That is the way it is supposed to work.
16. What uniform format should be used for providing progress reports?

* Unit, conditions, actions, needs (UCAN) 50.0%
* Location, unit number, name, assignment, resources (LUNAR) 15.0%
* Who, what, where 22.5%
* Progress, air status, conditions, team (PACT) 10.0%
* Other (please) 2.5%

Other comments:
- Sector reports e.g. Roof, attack, reporting fire conditions

17. When should progress reports be provided? (Check all that apply)

* As requested by the Incident Commander 55.0%
* As tasks are completed 77.5%
* At timed intervals prompted by Dispatch 12.5%
* Other (please specify) 9.8%

Other comments:
- Established “benchmarks” as set forth by Erie County Protocols
- During a PAR also
- Changes in conditions (heat, smoke, fire)
- When working units deem necessary

18. What benchmarks should be announced over the radio? (Check all that apply)

* Primary search all clear 100.0%
* Secondary search all clear 87.5%
* Victim located 97.5%
* Fire knocked down 90.0%
* Ventilation complete 77.5%
* Extension complete 25.0%
* Overhaul complete 27.5%
* Salvage complete 15.0%
* Fire under control 75.0%
* Situation contained 72.5%
* Exposure covered 22.5%
* Back-up line in place 55.0%
* Command terminated 95.0%
* Other (please specify) 10.0%

Other comments:
- “Water on fire”
- Water supply established
- Utilities, PAR intervals
- Fire is OUT. Utilities are off

19. **What information do you feel should typically be conducted face to face (Check all that apply)**

* Transfer of incident command (followed by announcement over the radio) 95.0%
* Communications between crews operating on the same division 75.0%
* Communications between crews on the same division and one above or below 5.0%
* All interior to interior communications 5.0%
* Exterior communications on the same side of the structure 67.5%
* Exterior communications on the same side and/or an adjacent side 32.5%
* All exterior to exterior communications 12.5%
* Other (please specify) 4.9%

Other comments:
- Size of the structure could be a factor also.
- Communications that CAN be made face to face, to eliminate some on radio transmissions. Except, when danger, or important for everyone to know about.

20. **How should personnel confirm receipt of a radio transmission?**

* "Clear" 15.0%
* Unit identifier and clear (e.g. “100 is clear” or “Smith is clear”) 27.5%
* Unit identifier, repeat the request or message, and clear 55.0%
  (e.g. “attack from command – proceed to div. 2”; attack is clear on moving to division 2”)
- Other (please specify) 2.4%

Other comments:
- “Clear”, “ok” or “message received”

21. **Along with the initial size-up information, what do you feel should be included in the initial radio report? (Check all that apply)**

* Command identifier 87.5%
* Command post location 45.0%
* Offensive vs. Defensive strategy 62.5%
* Additional resources needed 62.5%
* Initial actions being taken 55.0%
* Presence of a basement 22.5%
* Special hazards 75.0%
* Other (please specify) 4.9%

Other comments:
- Any information available about occupants
- Building construction type or use group. Presentation of fire/smoke conditions

22. Should a county fireground communications operational guideline include a training recommendation component?

*Yes 75.0%
*No 2.5%
*No, but should be included in another SOG, such as a training guideline 22.5%

23. Should a county fireground communications operational guideline include recommendations for when information should be relayed face to face?

*Yes 79.5%
*No 20/5%

24. Should a county fireground communications operational guideline include a component for recommended information to be transmitted during the initial size-up?

*Yes 97.5%
*No 2.5%

25. Should a county fireground communications operational guideline include a component for radio channel selection during multi-department operations?

*Yes 100.0%
*No 0.0%

26. Should a county fireground communications operational guideline include a component for recommended uniform structure of progress reports?

*Yes 92.3%
*No 7.7%
27. Should a county fireground communications operational guideline include recommendations for critical information transmission?

*Yes  97.5%
*No   2.5%

28. Should a county fireground communications operational guideline include recommendations for “face to face” versus “over the radio” messages?

*Yes  77.5%
*No   22.5%

29. Should a county fireground communications operational guideline include a component for recommendations on sending and confirming radio transmissions?

*Yes  92.5%
*No   7.5%

30. Please provide any additional information you would like to convey regarding a county fireground communications operational guideline.

- In question 15 the caller should be announced first in case the caller starts the message before the repeater is engaged. This would help ensure that the receiver hears their unit number or fireground position.
- Everyone has a set way of communications at this point. The biggest issue is that no two ways are the same. At some point someone has to give in and make a uniform way of doing things. Are we one department? No. Do we all do things the same way? No. If we have a large incident, are we all going to be there doing our own thing? Absolutely. Bottom line is this – we are a county of different departments, but the one thing we have in common is that most of us talk to the same dispatchers. In large cities you have 20-30 stations, several battalions and all different types of companies, engines, ladders, rescues and even those EMS things. Somehow they all manage to communicate clearly and mostly effective and so should we.
- I think that a simplex radio channel should be used on all working fire incidents. This would provide a more reliable means of communicating within structures and would stop tones from interrupting fireground communications. This should happen as units arrive on scene of any emergency, whether a single department or multi department emergency.
- Uniformity!
I feel as if the survey covered the essentials at this time.

Marx radios

County training scenarios using the recommended guidelines.

On multi-department incidents some operations may call for its own channel. In a recent drill the incident was managed on one channel. It may have been helpful to use two channels to minimize radio traffic. Also each department talks differently on the radio. Full-time departments use radios everyday and volunteer departments do not. When bringing in a volunteer department you may not get an officer, you may get two or three firefighters just out of school who have never used a radio. Some departments may not have the same radio channels as others in the county.