Fire Service Radio Communications:

The Use of Dispatch & Working Channel Communications

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ABSTRACT

Concerns over radio channel overloading prompted the Middleburg Heights Fire Department to research the use of additional radio channels to supplement their existing single talkgroup use. The problem prompting this research was confusion of fire personnel regarding radio traffic while operating multiple incidents. In addition, concerns were raised about the safety of operational personnel if dispatchers did not monitor the additional channels.

The purpose of this research was to identify national standards and recommendations concerning the use of fireground/tactical channels and determine whether the use of fireground/tactical channels (FG/TAC Channel) would be beneficial to the MHFD and similar departments. The evaluative research method was used. The research questions were:

1. *How does the Middleburg Heights Fire Department's present daily radio procedures allow for the operations of larger scale or multi-incident emergency incidents?*

2. *How do similar fire departments handle day-to-day and larger scale incidents radio communications?*

3. *What changes need to be made in order to effectively establish communications on working channels (talk groups) for large or multi-incident radio traffic?*

4. *What are the costs and benefits (monetary and behavioral changes) to establishing the operational change in communications?*

The literature review found nationally accepted recommendations for fire communication systems and identified cases of communications-related firefighter casualties. A survey was conducted of various fire departments to obtain information regarding overloading problems and multichannel operations. The results showed that the single-channel system in Middleburg Heights was dangerous. Documented cases of radio channel overloading and lack of monitoring by dispatchers were identified in other departments. Most fire departments surveyed required the use of a fireground/tactical channel and dispatchers to monitor those fireground channels.

Recommendations included implementing the use of fireground/tactical radio channels available in the current radio system, recommending that all tactical channels be dispatcher monitored whenever in use; and providing additional radio training for dispatchers and line personnel.

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INTRODUCTION

Statement of the Problem

One of the most significant problems facing firefighters within a structure on the fireground is the ability to communicate reliably between the firefighters themselves and between the firefighters and the command post or communications center. In an ideal world, firefighters would be able to communicate with one another and the command post at all times, regardless of where they are or what they are doing. However, this is not the case. (NIOSH, 2003). This is especially illustrated in large scale incidents and incidents involving mutual aid.

The problem this study addressed is the increased amount of confusing radio traffic on one channel when multiple incidents occur at the same time. While this makes it difficult to follow the multitude of radio transmissions, the more significant factor is that fireground commanders are setting themselves up for disaster that may involve the loss of life. This includes civilian and fire personnel alike.

The Middleburg Heights Fire Department (MHFD) and the surrounding suburban fire departments utilize an 800 MHz trunked radio system. Due to the size and make-up of the MHFD, the MHFD is comfortably able to use the dispatch talkgroup (*TG*) for all communication during the majority of their calls. The basis of these communications is to mark response, arrival, and departure times. Little or no tactical communications is transmitted on these runs.

Purpose of the Study

The purpose of this study was to determine how the Middleburg Heights Fire Department (and similar fire departments) should employ the use of tactical channel assignments during large incidents and incidents that receive assistance from mutual aid fire departments to enhance scene safety, prevent firefighter and civilian deaths & injuries, and promote effective tactical operations through clear, concise radio communications. This was concluded using a survey and evaluation of the results.

Research Questions

The following questions will be answered by historical and descriptive research:

1. *How does the Middleburg Heights Fire Department's present daily radio procedures allow for the operations of larger scale or multi-incident emergency incidents?*

2. *How do similar fire departments handle day-to-day and larger scale incidents radio communications?*

3. *What changes need to be made in order to effectively establish communications on working channels (talk groups) for large or multi-incident radio traffic?*

4. *What are the costs and benefits (monetary and behavioral changes) to establishing the operational change in communications?*

BACKGROUND AND SIGNIFICANCE

The Middleburg Heights Fire Department (MHFD) is a suburban fire department located approximately 12 miles southwest of Cleveland, Ohio. Middleburg Heights is a city with a full time residential population of almost 16,000 and a daytime/transient population that swells to approximately 80,000 plus. The fire department is comprised of 24 line officers and firefighters that work a 24/48-hour work schedule. The chief and assistant chief work 40 hours, Monday through Friday. The fire department protects eight square miles and responded to 2,682 emergency requests last year. Within these eight square miles are two hospitals, three surgery centers, four nursing homes, a regional senior center, an assisted living center, an electric sub-station and clean/drinking water distribution centers, and an office of nearly every state and federal agency.

The MHFD currently staffs with 5-6 men on duty daily. Like many fire departments of our time, approximately 80% of calls are emergency medical services related. Under normal circumstances, the MHFD can respond to two simultaneous calls. Radio traffic is usually centered on benchmarks of response, arrival, and departure. Little or no tactical operations radio traffic is transmitted during these incidents.

On average, the MHFD can handle one to two calls at a time. More complex incidents or incidents that require the assistance of mutual aid companies result in an increased amount of radio traffic. This radio communication frequently expresses explicit and detailed direction from the incident commander. I was working a large apartment housing complex fire as part of a

mutual aid assignment. The host fire department was well out of our normal mutual aid response area and had called approximately 12 fire departments for assistance. On scene there were approximately one hundred firefighters working this job. Radio communications were calm and concise. The incident commander had set up his radio communications modeling the ICS structure. The incident commander was on one channel with his command staff. Each command staff position (operations, logistics, staging, etc.) then had a radio channel to direct their operations on the fireground. No radio traffic was missed because of the number of firefighters present on scene and the high amount of messages that were being delivered via the radio. The sector/division officer (and aide) was the only person(s) that had needed to directly communicate with the incident commander. Every firefighter did not have to be on the same channel as the command staff, they only had to communicate with their sector/division officer. Approximately one hundred firefighters could hear their pertinent radio traffic without having to waste valuable time when they had pertinent information to pass along. This fire experience underscored the possibilities of fireground/tactical radio communication use and then initiated a review of the current MHFD SOP/SOG's of fireground communications.

On more involved incidents such as structural fires, extrication rescues and motor vehicle accidents the amount and types of radio traffic increases. The above mentioned time benchmarks are noted as well as advanced orders from the officer in charge and reports of changing conditions and hazards reported back, all via the radio. Many times these incidents occur simultaneously as another call. The resulting problem is large scale or multiple incidents at the same time with overlapping radio traffic. This radio traffic can be confusing to the fire personnel at each incident with orders and reports from one incident being heard by fire personnel at the other incident. Adding in the use of mutual aid companies assisting at one or

both scenes, the increased amount of radio traffic compounds this possibility of mixed up radio traffic and results in confusion.

While this is not a daily situation, the MHFD and neighboring department's personnel have noted the confusion on several incidents. Dispatchers also use the dispatch talkgroup for intra-station and departmental paging. Recently, a multiple alarm structure fire required mutual aid from five cities involving eight pieces of apparatus, three command vehicles and approximately 40 fire personnel. At the same time another crew of firefighter/paramedics was handling EMS calls on the other side of town. All working personnel operated on the same talkgroup. This situation was further compounded by an incident commander who frequently did not answer his radio when called and required an officer to locate him each time a new decision need to be made.

This problem is not likely to go away anytime in the near future. On average, the emergency responses at the MHFD increase approximately six percent annually. This means that the probability of calls occurring simultaneously will increase instead of decrease. Inevitably, the probabilities of these situations become potentially more difficult and possibly disastrous.

The results of this research is intended to determine if using a separate talkgroup is necessary and a viable solution to streamline radio communications and reduce the possibility of confusion. Should the research prove the need for use of radio channel or talkgroup assignments, a standard operating guideline (SOG) can be developed and followed by line commanders and personnel. Ultimately this SOG should be applicable and practicable to both small and large, involved incidents as well.

This research was intended to identify nationally accepted standards or recommendations addressing fire service communications systems, particularly the use of fire ground or tactical channel use. Second, an attempt was made to identify whether the use of fireground or tactical channel would be beneficial to the MHFD and departments of similar composition.

LITERATURE REVIEW

Electronic radio communications first entered the fire service in the 1940s by way of apparatus-based two-way mobile radios (Spahn, 1989). In the 1960s and 1970s, technological advances made portable radios feasible for use in the fire service (Spahn, 1989). Portable radios offered to dramatically increase the flow of information from the company level to the command level. This, in turn, lessened the need for the chief to be just behind the nozzle man. The chief could remain outside the fire building, and rely upon company officers to relay pertinent information. Fireground operational activities could be coordinated effectively from a remote location to an extent never before possible. Often dispatchers have been the only individuals capable of hearing a feeble cry for help from a portable unit (Spahn, 1989, p.18).

TR-099 (1999) reviews inadequate fireground communication as the repeatedly cited contributing factor of having a negative impact on firefighters and civilians. His probe, on behalf of the United State Fire Administration (USFA) was to study the potential causes of communication breakdown and provide recommendations to assist fire departments improve their fireground operation communications. In his report, he cites that a dedicated dispatch channel is used to conduct routine communications. Preventing routine radio traffic from interfering with incident specific communications, tactical or fireground channels may be used depending on radio system capability and department criteria (SOG's). Thiel promotes the use of fireground or tactical channels but cautions that training in the use of tactical channels and familiarity of the of radio equipment by fire personnel are imperative.

NFPA 1500 (2007) states that the incident commander, upon arrival of the incident scene is responsible to initiate, maintain, and control incident communications. At an emergency incident, the incident commander shall be responsible for the overall management of the incident

and the safety of all members involved at the scene. Keeping clear, concise communications is a priority to insure a high level of safety.

Communication problems are continually cited as contributing factors in fires and emergency incidents where firefighters are killed or injured. The number of "near-miss" incidents where fireground communication was ineffective may be higher than generally realized (TR-099, 1999).

NFPA 1221, "Standard for the Maintenance and Use of Public Fire Service Communication Systems," 2007 Edition, further identified that the standard shall cover the installation, performance, operation, and maintenance of public emergency services communications systems and facilities. Chapter 9.3.1.3 stated, "A communications radio channel, separate from the radio dispatch channel, shall be provided for on-scene tactical communications. (NFPA 1221, 2007).

NFPA 1561 (2005) Standard on Emergency Services Incident Management System specifically describes communication systems and the incident commanders' role.

6.1.1 It states that the communications system shall have capacity for the emergency response agency's routine and large-scale emergencies. Specifically it points out that an Emergency Service Organization (ESO) shall provide one radio channel for dispatch and a separate tactical channel to be used initially at the incident. Like the incident command system/National Incident management system the abilities of the radio system must be able to expand. The standard states that when a Tactical Level Management Component (TLMC) has been implemented, an ESO shall provide a dispatch channel, a command channel, and a tactical channel. When dealing with multiple incidents at the same time, an ESO shall provide additional radio channels for the volume of communications relating to incidents with multiple tactical

channels and for the complexity of multiple emergency incidents. The abilities of the radio system do not stop there, however. The communications system shall provide reserve capacity for complex or multiple incidents. No necessarily requiring additional capacity but the ability of true interoperability amongst radio users the standard states that the radio capabilities shall provide for communications with mutual aid resources or other agencies that could be expected to respond to a major incident.

Additionally, municipalities should consider establishing and maintaining multiple operating frequencies for emergency services, allowing portable radios at incidents to be equipped with two frequencies, one channel for tactical messages and one channel for command (NIOSH, 2002).

NFPA 1561 (2005) Chapter 7.1.9 states the incident commander shall be responsible for controlling communications on the tactical, command, and designated emergency traffic channels for that incident.

TR-099 (1999) states, "A dedicated dispatch channel is most often used to conduct routine communications operations." To prevent routine radio traffic from interfering with incident-specific communications, active incidents may be assigned to other channels for tactical operations according to criteria established by the agencies involved and determined by the available radio system capacity. Modern, “trunked” radio systems may have enough available frequencies for each incident to be assigned a separate tactical channel. Multiple-alarm fires or complex incidents like those involving hazardous materials or technical rescues may require multi-channel operations. Some departments, like the Fire Department of New York (FDNY), regularly implement a command channel, separate from the fireground tactical channel, solely for the use of command-level officers at major incidents.

While the use of multiple channels for emergency operations is desirable, there are several important precautions that will help prevent problems from arising out of their use. Training is of vital importance to help familiarize personnel with using multiple channels on an incident and to identify potential problems. Unfamiliarity with the use of new radio equipment in Indianapolis was cited as a contributing factor in the casualties at the Indianapolis Athletic Club fire. Frequent utilization of the more complex, multi-channel systems during drills and routine operations will help enhance effective communication during unusual events (Thiel 1999).

Where fire departments use multiple radio channels, such as a primary dispatch or operations channel and a command or tactical channel, Cummings, Murtagh, Souder & Spahn (FEMA/USFA) wrote that the operations channel is the routine communications link from the incident to the communications center. Thus, it is necessary for the communications center to have the ability to monitor the fireground or tactical channel.

Varone (1996) studied fire department communications operations for his National Fire Academy CFO project found nationally accepted recommendations for fire communication systems. This research also identified cases where communications failures involving dispatch and tactical radio traffic on the same channel resulted in firefighter casualties.

The New Jersey Bureau of Fire Safety (1989), investigated the Hackensack Ford fire, and in the like the other investigators cited major communications problems as a contributing factor firefighter deaths. The Bureau audited the radio communications tape and discovered that approximately 50 percent of all radio communications made at the Hackensack Ford fire, were never acknowledged. The Bureau recommended that all fire departments in the State of New Jersey establish a minimum of two separate radio channels so as to permit the dispatching function to take place on a channel other than the one being used for fireground communications

(Varone, 1996).

Routley (1991) investigated the East Bay Hills fire in Oakland, California. An Oakland Fire Department Battalion Chief was one of 25 deaths that resulted from this wildland-urban interface fire. Routley found that the communications system being used by the Oakland Fire Department was completely inadequate. Oakland used a single radio channel for both dispatch and emergency operations. Although a backup channel was available to handle all other radio traffic during an emergency, all six alarms at the East Bay Hills fire were operating on the main channel. The result was that units were routinely transmitting over each other, blocking effective communications.

Routley (1995) cited communications problems as a contributing factor in the failure to realize that three members were still missing. Pittsburgh's fire department and emergency medical services were separate municipal departments that routinely responded to fires together. Each department operated on entirely separate radio channels. Direct radio communications between emergency medical personnel and the fire department IC was not possible. This arrangement contributed to the confusion as emergency medical personnel relayed messages through their dispatcher, to the fire dispatcher and ultimately to the IC about who was missing and who had been rescued.

To maintain control of a high-rise incident it is critical that the incident commander have a working communication system. The floor commander must be in contact with the incident commander and the incident commander needs to be able to be in contact with fire communications. With all this communication, radios need to have at least two channels. One channel to fire communications and one fire ground channel. A two-channel system is the minimum radio communication needed (Fox, 2003).

If possible, each crewmember should carry a radio with a designated frequency/TAC channel for search line/Safety Engine/RIT search operations ONLY. Search line operations are very much dependent on effective communications, failure to use a separate frequency may cause critical information to be missed thereby jeopardizing the safety of operating personnel (Sendelbach, 2003).

Brunacini (2004) repeatedly throughout his text echoes that the incident commander first on the scene is responsible for establishing communications. This includes the use of a secondary channel for fireground operations. By the IC placing communications on a tactical channel protects and shelters the firefighters in the hot zone. Additional channels may be utilized as the incident expands and does the command staff respectively. Command's highest priority is to maintain the communications integrity between the hazard zone and the command post.

From the above referenced literature, the following points can be summarized. First, with the advent of portable radios, communications on the fire ground improved significantly. Second, poor radio communications is a contributing factor in resulting firefighter and civilian deaths. This is illustrated in NIOSH reports citing the lack of use of a fire ground/tactical channel. Third, the incident commander is responsible for establishing and maintaining the proper fire ground communications necessary for that incident. Finally, numerous NFPA standards establish the need, importance and requirements of using at least one additional channel beyond the use of the dispatch channel.

PROCEDURES

Information regarding additional data was collected by an electronic survey to area fire departments of similar make up and responsibility. Furthermore, along with the survey questions, requesting information regarding SOP/SOG's referencing fireground communications was collected and reviewed. Initially, it was thought that in order to maintain like values, information would not be collected from large metropolitan or smaller volunteer/part-paid departments. Upon further study, it was determined that large metropolitan departments and smaller volunteer departments alike, encounter similar communications problems. Large departments many times have large incidents that involve several engine, ladder and squad companies that mirror the smaller suburban fire departments' use of mutual aid. Also, smaller volunteer departments' use of mutual aid reflects that of many suburban departments' operations.

Thus, the survey was completed by 94 Ohio fire departments with populations that range from less than 10,000 to 100,000 *(see Figure 2, Appendix 3).* Departments selected and sent the survey were chosen by available e-mail addresses through the Ohio Fire Chief's Association (OFCA). Survey requests were sent via the OFCA staff. The departments surveyed were 10% urban, 72% suburban and 18% rural *(see Figure 3, Appendix 3).* Given a two month period in order to complete the survey, results were then reviewed and evaluated by the author.

Definition of Terms

CHANNEL The term "channel" as used in this research refers to a setting on a radio, regardless of whether or not the "channel" is simplex, duplex or trunked.

SIMPLEX The term "simplex" as used in this research refers to a radio channel that uses a single radio frequency to both broadcast and receive.

DUPLEX The term "duplex" as used in this research refers to a radio channel that uses two separate radio frequencies, one to transmit, and the other to receive.

REPEATER A repeater consists, at a minimum, of a radio receiver and a transmitter. A radio signal is received on one frequency by the receiver, and then rebroadcast over a new frequency, usually at much increased strength. A number of receivers can be located throughout a geographic area to ensure that a radio transmission made anywhere within the area will be able to reach at least one receiver. Repeaters are used with duplex radio systems to increase the range of portable and mobile radios.

TRUNKED A trunked radio system is a complex communications system that functions more like a wireless telephone system than a traditional radio system. With a trunked system, a channel setting on a radio does not correspond directly to particular radio frequency. Rather, each channel setting is referred to as a "talk group." Persons with radios set on the same "talk group" are able to communicate with each other. When a user wishes to send a message over the radio, the system automatically selects which frequency the particular message will be transmitted on. The architecture of the system ensures that listeners on the same talk group will then receive the message, regardless of which radio frequency is actually used to transmit the message (McMillian, 1991).

Limitations of the Study

Of the points of contacts that were readily available, several instances of more than one person from a particular department were surveyed and answers were not always consistent for that particular department. The study made an effort to prevent duplicate responses from being tallied as individual responses. One hundred eight responses were received. Ninety-four departments were indentified by name (87%). Eighty-six percent provided a contact person,

83% provided a telephone number and 85% provided an e-mail address. Several surveys had a minimum of questions answered. It would appear that several surveys were quit while completing the questions and not finished.

RESULTS

The overall consensus from those surveyed is that additional radio channels and use of those channels improve communications. Only 3% responded that additional radio channels would hamper communications and 16% had no opinion. Complete results of the survey are available in Appendix 2.

From the results, 77% of those departments responding have a SOP/SOG regarding the use of a fireground/tactical (FG/TAC) channel. Thus, this also indicates that a minimum of 77% of the departments surveyed use a FG/TAC channel. When broken down, the use of this channel is determined either at the time of dispatch or by the request of the officer in charge of that incident. Seventy-eight percent of the respondents indicated that they do not handle all of their radio traffic on a single channel. Of the 22% that do use only one channel, multiple reasons were given as justification.

Changing to a FG/TAC channel is initiated by two factors. Thirty-three percent are driven to change to a FG/TAC channel by dispatch or a SOP/SOG and 66% change by the order of the incident commandeer. Fifty-three percent indicate the order to change to a FG/TAC channel is part of the IC's initial size-up.

Training in communications appears to be regarded as an important facet of communications. Eighty-one percent train their personnel on the technical aspects of the radio. Seventy-five percent train their personnel when to make the change to a FG/TAC channel.

Four out of ten fire professionals surveyed indicate that they have had to wait to transmit a critical message at the scene of an emergency. The largest segment indicated that this happens occasionally (approximately once or twice a year) with 33% of those responding. The next

largest segment (23%) stated that this happens frequently (approximately three to six times a year). Nineteen percent stated that this condition presents itself very frequently, or more than six times a year. Again, respondents indicated that if they use more than one channel for radio traffic, communications are improved. The number of dispatch and FG/TAC channels varies widely depending on the make-up of the department itself. About half of the departments surveyed use mutual aid channels in addition to the FG/TAC channels utilized for their own department's communications. The number of these channels also varies by the individual department's make-up.

Communications being monitored by dispatch personnel ranked four out of ten. This included the dispatch channel, and any other channel used for FG/TAC or mutual aid purposes. Those channels not monitored by the dispatch center resulted in a wide variety of responses. Many answers were given as to what steps are taken to insure that critical fireground messages were received and acknowledged when utilizing a channel that is not monitored. Ultimately, from the responses, this burden fell upon the IC to monitor, acknowledge and act upon these messages properly. While one percent cited the use of a FG/TAC channel was too complicated for their personnel, the majority of respondents (31%) cited the lack of dispatch personnel to be able to monitor more that one channel as the reason that prevents them from monitoring FG/TAC channels. The next largest group (26%) indicated that dispatch was unable to monitor the FG/TAC channel altogether. Smaller segments included the lack of SOP/SOG's, lack of training to use a FG/TAC channel, current equipment that does not support the use of a secondary channel and finally, the complete lack of a FG/TAC channel (*see Figure 1, Appendix 3).*

None of the departments surveyed indicated that a firefighter was killed or injured due to the lack of monitoring a FG/TAC channel. However, two percent of the departments responding

to the survey indicated that they have had a firefighter killed or injured. These respondents cited that a contributing factor to this situation was that the radio channel was too busy.

Demographics of those surveyed included those communities with populations of less than 10,000 (14%), 10,000 to 20,000 (38%) and 50,000 to 100,000 (16%)(Fig. 2). Department types included rural (17%), suburban (74%) and urban (10%) fire departments (Fig. 3).

In relationship to the literature and the survey results, the Middleburg Heights Fire Department's daily radio procedures presently do not allow for efficient operations of larger scale or multiple simultaneous emergency incidents. At present, there is no SOP/SOG regarding the use of a FG/TAC channel. Senior command staff's reluctance to use FG/TAC channels hinders the benefits and efforts of line officers to streamline their communications for clarity and safety of the line firefighter *(see Figure 1, Appendix 3).*

The survey results also show that only a small minority of departments do not use a FG/TAC channel. Twenty-two percent handle all of their radio traffic on one channel. The survey results correlate that those departments that use more than just the dispatch channel also have improved communications for their personnel. Overall this shows that similar departments handle communications for the day to day and larger scale incidents with the use of additional radio channels. Eighty-two percent believe that the use of additional channels improves communications. Only three percent believe that communications are not as effective. Sixteen percent had no opinion on this matter *(see Figure 4, Appendix 3).*

RECOMMENDATIONS

Currently, the Middleburg Heights Fire Department does not have any radio procedures that allow for operations of large or multiple incident emergency scenes. Recommendations included implementing the use of fireground/tactical radio channels available in the current radio system, recommending that all tactical channels be dispatcher monitored whenever in use; and providing additional radio training for dispatchers and line personnel.

The current radio system utilized by the Middleburg Heights Fire Department is an 800 MHz trunked radio system. The Middleburg Heights Fire Department has the ability to utilize tactical talkgroups unique to the department itself. In addition it has ten tactical channels that are shared by the eight fire departments on the radio system. Each fire department is assigned a primary tactical channel for their use. The Middleburg Heights Fire Department's assigned tactical channel is monitored by dispatch. There are six additional 'common' talkgroups that are shared by all users of the radio system. This includes police, fire, service, recreation, building and administrations of the eight cities using the radio system. Furthermore, the department can use the four 8ITAC conventional repeater frequencies and the State of Ohio fire mutual aid VHF channel patch if necessary. Overall the Middleburg Heights Fire Department has the capability to utilize an additional 17 channels for communications. Not all of these channels are currently monitored by dispatch.

Since the current radio system already has the capacity and capability built into it, there is no additional monetary expenditure necessary for equipment. Changes directed through the SOP/SOG would incur a behavioral expense of time in the form of training as personnel became accustomed to the new procedure(s).

DISCUSSION

As indicated earlier in the results section, the consensus held by those surveyed reflects that the use of additional radio channels improves communications (Figure 4). This is supported by TR-099 (1999), which states that routine radio traffic should be prevented from interfering with incident specific communications. Brunacini repeatedly echoes this mantra. He states that the first incident commander on scene is to establish and control communications between dispatch and those operating on the fireground.

Varone (1996) in his studies established that communications failures between dispatch and those working on the fireground were conducted on the same channel, resulting in firefighter causalities. The two percent of those surveyed that stated they could attribute crowded radio traffic, as a factor to firefighter injuries and deaths, is a low percentage. The accepted level of deaths & injuries supported by firefighters, unions, administrations and professional organizations is zero.

Cummings, Murtagh, Souder & Spahn (FEMA/USFA) wrote that the operations channel is the routine communications link from the incident to the communications center. Thus, it is necessary for the communications center to have the ability to monitor the fireground or tactical channel. Seventy-eight percent responded that they use multiple channels for communications. These results emphasize that using multiple channels regulates communications and separates routine from tactical communications.

In essence, better than ¾ of those responding to the survey use one FG/TAC channel as a minimum. Of the ¼ of the respondents not using a FG/TAC channel, limitations exist within their organization that prevent this. As stated earlier, these limitations include the lack of a separate FG/TAC channel, equipment that does not support the use of a second channel, training

personnel to use a FG/TAC channel, lack of a SOP/SOG determining the use of a FG/TAC channel, use of a FG/TAC channel is too complicated for fire personnel, dispatch unable to monitor a FG/TAC channel and not enough dispatch personnel to monitor more than one FG/TAC channel. Change is constant. The results illustrate the need and effectiveness of using a separate FG/TAC channel for fireground operations. The future complexity of incidents is assured to increase. Terrorism, Weapons of Mass Destruction, Chemical-Biological-Radiological-Nuclear-Explosive (CBRNE), and pandemic infestations are high profile complex incidents that can strike anywhere. On a local level, infrastructure failure of utilities (gas, water, electric), quick degradation of modern light-weight building materials under fire, the use, transportation and storage of hazardous materials and emergency medical care especially of the elderly will increase run volume and increase radio communications. Separating routine from tactical operations as well as separating communications from incidents will be necessary. The current use of a single FG/TAC channel will be a minimum. The use of a dispatch and two or more FG/TAC channels to separate tactical or command functions will be the norm if not starting already in today's fire service culture.

Both the literature and the survey findings agree that use of an additional radio channel is beneficial. In developed urban areas it is already a necessity for proper, safe and effective communications. In the lesser developed suburbs and rural sectors of our population, the use of an additional channel or channels is becoming essential for effective operations.

RECOMMENDATIONS

Currently, the Middleburg Heights Fire Department does not have any radio procedures that allow for operations of large or multiple incident emergency scenes. Recommendations include:

1.) Implementing the use of fireground/tactical radio channels available in the current radio system by use of a department SOG.

2.) Recommending that all tactical channels be dispatcher monitored whenever in use.

3.) Providing additional radio training for dispatchers and line personnel.

The current radio system utilized by the Middleburg Heights Fire Department is an 800 MHz trunked radio system. The Middleburg Heights Fire Department has the ability to utilize tactical talkgroups unique to the department itself. A SOP/SOG should be initiated and developed for the Middleburg Heights Fire Department. This would provide a basis for determining when to appropriately use the FG/TAC channels and which FG/TAC channel to use. Once drafted, additional training would be required for both line and dispatch personnel to become additionally familiar and comfortable with the use of the SOP/SOG and the use and switching to the FG/TAC channels.

In addition, the current radio system has ten tactical channels that are shared by the eight fire departments on the radio system. Each fire department is assigned a primary tactical channel for their use. The Middleburg Heights Fire Department's assigned tactical channel is now monitored by dispatch. There are six additional 'common' talkgroups that are shared by all users of the radio system. This includes police, fire, service, recreation, building and administrations of the eight cities using the radio system. Furthermore, the department can use the four 8ITAC conventional repeater frequencies and the State of Ohio fire mutual aid VHF channel patch if

necessary. Overall the Middleburg Heights Fire Department has the capability to utilize an additional 17 channels for communications. Not all of these channels are currently monitored by dispatch. However, dispatch has the ability to monitor these TG's as needed while still monitoring the dispatch TG..

Beneficially, all the above recommendations provide for safer operations for fire personnel and the civilians we protect. Use of a FG/TAC channel provides for clear, concise communications without the chance of cross communicating amongst two or more incidents that are occurring at the same time. Dispatcher monitored FG/TAC channels insure that 'another set of ears' that are situated in a quiet environment have the ability to hear distress calls and other pertinent fire ground communications. Additional training for dispatch and fire service personnel assures greater competency in use of the radio equipment and communications system.

Since the current radio system already has the capacity and capability built into it, there is no additional monetary expenditure necessary for equipment or use of the radio system. Changes directed through the SOP/SOG would incur an expense behavioral change through time in the form of training as personnel became accustomed to the new procedure(s). No significant monetary expense for training of personnel should occur since training of personnel could take place during regular duty time. Some 'off duty' training could take place at the discretion of the department's administration.

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APPENDIX 1 – SURVEY QUESTIONS

1. Does your department have a SOP/SOG relating to the use of fireground channel usage?

Yes/No

2. When does your department initiate the use of these channels?

3. Does your department handle all radio traffic on the same channel? Yes/No

If you answered yes to the above question, why?

_____

_____

_____

4. Who in your department initiates changing to a fireground channel? _____

5. Does your department specifically train personnel on the technical use of the radio itself? Yes/No

6. Does your department specifically train personnel when to make the change to a fireground channel? Yes/No

7. Is the decision to change to a fireground channel part of the incident commander's initial size-up of an incident? Yes/No

8. Have your ever had to wait to transmit a message at the scene of an emergency that you considered to be critical, while the radio was tied up with radio traffic not related to the incident that you were at? (For purposes of this question, assume the term critical means that lives were in jeopardy or potentially in jeopardy.) Yes/No

9. If you answered yes to the above question, then in your personal experience how frequently has such a problem occurred?

_____ Very infrequently (less than once every five years)
_____ Infrequently (once every one to five years)
_____ Occasionally (approximately once or twice a year)
_____ Frequently (3 to 6 times per year)
_____ Very frequently (more than 6 times per year)

10. Do you believe the use of additional radio channels would

_____ Improve communications
_____ Hamper communications
_____ Neither improve or hamper communications

In answering the following questions, please assume the term "radio channel" refers to a setting on a radio, regardless of whether the channel is a simplex (single frequency) channel, duplex (two frequency) channel or trunked system. When counting the number of channels, do not count "talk-around" channels that are part of a duplex channel that has already been counted.

11. Does your department utilize multiple radio channels? (Yes or no)

12. If your answer to the above question was yes, please answer the following:
    a. how many channels do you utilize in total? _____
    b. how many channels are used for dispatching apparatus? _____
    c. how many channels are used for fireground or tactical purposes? _____

13. Does your department utilize a separate "mutual aid" channel in addition to those listed above, in order to communicate with neighboring departments? Yes/No

14. If yes, how many mutual aid channels does your department use? _____

15. Are all of the radio channels used for dispatch, fireground, and tactical purposes, monitored continuously by dispatch personnel when being used? (Yes or no)

16. If your answer to the above question was no:
    a. Please explain which radio channels are not monitored by dispatchers:
    _____
    _____
    _____

    b. What steps (if any) does your department take to ensure that critical fireground messages (such as a "Mayday" message, or a building evacuation order), are properly transmitted, received, acknowledged and/or acted upon when using unmonitored channels?
    _____
    _____
    _____

17. What factors prevent your department from utilizing a fireground channel?
    _____ Lack of a fireground channel
    _____ Current equipment does not support use of secondary channel
    _____ Training personnel to use a fireground channel
    _____ Lack of a SOP/SOG determining the use of a fireground channel
    _____ Use of a fireground channel is too complicated for personnel
    _____ Dispatch unable to monitor a fireground channel
    _____ Too few dispatch personnel to monitor more than one fireground channel

18. To the best of your knowledge, has your department ever had a firefighter killed or injured at an incident scene where the fact that the radio channel was too busy with other radio traffic was found to be a contributing factor? Yes/No

19. To the best of your knowledge, has your department ever had a firefighter killed or injured at an incident scene where the lack of monitoring of the radio channel by dispatch personnel was found to be a contributing factor? Yes/No

20. What type of radio system do you operate:

_____ UHF Simplex/Duplex (repeater)
_____ VHF Simplex/Duplex (repeater)
_____ 800 MHz trunked
_____ other trunked
_____ other

21. Please answer the following questions about your fire department.
Population served:

_____< 10,000 _____ 10,000-20,000 _____20,000-50,000

Department type:
_____ Fully Paid, _____ Combination, _____ Fully Volunteer,
Community Served:
_____ Rural, _____ Suburban, _____ Urban

22. How many total responses does your department handle annually? (Please include all fire department responses including fire department emergency medical responses if provided, hazmat, service calls, false alarms, etc.) _____

23. Please note that your department will not be identified by name in the research report. However, I ask your cooperation in providing your department's name so that duplicate responses from the same department can be prevented.

Department: _____
Contact person: _____
Telephone or E-mail: _____

III. Population of subjects was done from small to large communities in the state of Ohio. Subject will be selected from the State of Ohio Fire Marshal's office. The idea is to survey a variety of departments that reflect a cross section of Ohio's fire departments to see how they use or do not use fireground channels. Particular attention will be paid to departments similar to the MHFD for comparison to the MHFD. The number surveyed depends on the number of departments available to be contacted through the fire marshal's information. In order to

hopefully receive an adequate number of responses, approximately 75 of each population category was surveyed.

IV. Population served:

_____< 10,000 _____ 10,000-20,000 _____20,000-50,000

V. Data collection was done by electronic survey. Surveys were sent out to fire departments with similar composition and service response areas to the Middleburg Heights (Ohio) Fire Department. Results were tabulated by the electronic survey program for statistical data and by this researcher for the written responses. Result interpretation will be shown by a combination of graphs, tables and percentages.

APPENDIX 2 – SURVEY RESULTS

Dispatch & Fireground Channel Assignment

Distribution: All Distributions

Dispatch & Fireground Channel Assignment

Page 1

1. Does your department have a SOP/SOG relating to the use of fireground channel usage?

		Response Count
Yes	77%	81
No	23%	24
Number of respondents answered this question		105

2. When does your department initiate the use of these channels?

		Response Count
[Comments are shown below]	100%	91

After the arrival of units on-scene regardless of the type of fire incident. EMS calls do not mandate the use unless it is a mass causality situation.
automatically on dispatch
Every Fire Dispatched or upon request.
Upon arrival and confirmation of a working fire or any other emergency scene that is multi-company in nature and lasting over an extended period of time.
During working structure fire or incidents of possible long duration.
At the request of command
Upon Arriving on scene, after the initial size up by the OIC.
We go to a fireground channel whenever we have mutual aid responding to our call. On an MVA or other fire call (fire alarm, car fire, etc) it is up to the incident commander's discretion as to whether or not we go to a fireground channel.
When one or more apparatus are responding to an incident such as structure fires, MVA's. This reduces clutter on the main dispatch channel. This is estabish in our standard operating guidelines
It is assigned by dispatch when alarms consist of 2 or more apparatus but can be requested by command at any time
Upon arrival at the scene.
The IC will designate the channel and have dispatch repeat it to everyone.
Every incident
After scene arrival and the size up is given.
The Tactical channel is assigned by dispatch as crews go responding. Tac. channels are only assigned to multi-apparatus incident such as structure fire and crashes.

	Response Count
We assign channels out in pairs, by odd numbers. The odd number automatically encumbers the the following even number. (Tac 1 will encumber Tac 2 for a given incident) The IC will have the ability to release or use the channle at their discretion. Crew do not switch to the tactical channels untill command has been established and the IC advises crews to switch.	
All runs are dispatch and then assigned to another channel. EMS runs go to an EMS channel MVC and similar go to a Rescue Channel Fire, Alarms, and other fire related go to a fire ground channel	
When multiple peices are committed	
Anytime we designate an operations section.	
At the discretion of the incident commander.	
When dispatch assigns a FG channel to our incident, responding crew members are to adjust thier portable radio to the assigned FG channel and diable the scan function. The mobile radio of the apparatus they're in is placed on the dispatch only channel with scan disabled. When crew members dismount from the apparatus they only should be listening to the FG channel on thier portable radio. The shift supervisor (initial IC) has two portable radios, one to listen to the assigned FG and the other to listen to Dispatch.	
Basically any time more than one company is working on a scene.	
OIC makes the decision based on size of call.	
Upon going enroute.	
It is automation on arrival.	
All fire details	
Upon dispatch	
Any/every incident when there are multiple companies responding, or whenever the volume of radio traffic warrants a dedicated channel.	
Varies depending on the nature of the run	
Communications assigns the talk group when you go enroute.	
All fire responses that involve multiple companies	
The dispatcher automatically assigns all responding companies to 1 of 3 fireground channels when they dispatch a fire run.	
After being dispatched to an alarm	
Evert detail	
As responding, Channel assigned durring dispatch	
When arriving on the scene of a multi-company incident	
First unit on the scene of any multi company operation/Upon establishing Command.	
This is a predetermined default at all incidents. All portables are set to the tactical channel.	
all working fires or at discretion of OIC	

	Response Count
When we have multiple incidents occurring at the same time.	
Usually when we get two or three mutual aid departments involved.	
When Multi agencies start coming in or command calls for it and breaks down into sectors.	
When assigned by dispatch.	
Firegrounds are assigned by Communications Center upon dispatch for fire dispatches.	
It's at the incident commander's discretion.	
We have the option to go to another channel once we mark the fire as a working fire but this never happens.	
Upon dispatch of an incident, the Communications Center assigns a fireground talkgroup to be used. This talkgroup is used immediately as units go enroute.	
On every fire related call dispatch.	
At the descrestion of the IC.	
When two or more units are operating on a fire scene	
No specified when to use	
Upon arrival	
Normally when the IC feels that the incident going to expand to more that one apparatus.	
If we have a confirmed structure fire, The Tac channel is is placed in service by the OIC once size up is complete.	
Upon dispatch; the County dispatching system has in place several core channels for EMS and 'Rescue' (auto crash/water rescue and the like) calls, then each department has a seperate fire ground channel for operations at fires.	
On the dispatch you are assigned to a channel	
Nothing official as our Fireground channel is not a repeated channel and therefore most officers are not compfortable in using it but will when the main band is busy.	
When dispatched	
when first unit marks on scene	
For on scene communications when multiple units are communicating to each other	
Once all units are reported responding to the dispatch they switch to the Tac channel.	
All response communications with the dispatcher will take place on the â??FD East Talkgroupâ??, unless directed otherwise by the officer-in-charge. Communications between responding units will occur on the Fireground Talkgroup assigned by the dispatcher.	
1) On "Working" Incidents where FFs are operating inside a structure. 2) On Fire Incidents that require the use of mutual aid agencies. 3) At the request of OIC	
Channels are assigned by main dispatch	
At any incident with 2 or more companies	

	Response Count
They are initiated by our communications center as dictated by the incident. i.e. Structure Fires, Vehicle Fires, MVA with Entrapment, etc.	
Any time their is a "working" incident or interior operations separate (away) from the Incident Commander	
Anytime a multiple unit dispatch occurs, the channel is available.	
At the time of dispatch. The 9-1-1 dispatcher assigns the channel to be used when the companies are dispatched and enroute.	
Upon confirmation of working fire	
Any emergency incident, or routine incident where there will be an increase in radio traffic.	
At the discretion of the IC.	
A channel is assigned for every run/incident. We have a dispatch channel, and EMS channel, 3 fire ground channels and an "Ops" channel for service runs. There are also 4 additional channels used for training, preventions or BS. This is a shared system/sop btween 6 FD agencies. We combined resources to make a Joint Communication Fire Dispatch Center.	
Initial dispatch	
Fireground channel is our normal operating channel. Should the need arise the rest of the city moves to a tac channel.	
At the time of dispatch.	
On all incidents	
Our department is assigned a FG channel on the initial dispatch for the incident. The IC can request additional channels if needed.	
On structure fires, hazmat and auto accidents or as needed during high volume periods.	
Incidents when units will be on scene for more than 20 min and/or when there are multiple agenncies responding to a single event.	
Any incident involving multiple companies	
We are dispatched by the City of Columbus and follow their SOP / SOG	
any incident that is going to generate a higher than normal volume of radio traffic. (and if the ic thinks of it)	
Upon dispatch.	
When equipment is dispatched, all are instructed to go to fireground. This leaves our dispatch channel open for EMS calls.	
On all dispatches that are assigned a FG, we use the FG assigned...	
at the request of the IC	
When the first unit arives on the scene and calls a working structure fire.	
As assigned by county dispatch.	
Upon Dispatch	
IC asigns channels at start of run	
Any incident where more than two units have responded and all working fires.	
Number of respondents answered this question	91

3. Does your department handle all radio traffic on the same channel?

			Response Count
Yes	[redacted]	22%	23
No	[redacted]	78%	81
	Number of respondents answered this question		104

4. If you answered yes to the above question, why?

			Response Count
[Comments are shown below]	[redacted]	100%	27
Fire companies will switch to a fire ground talk group after arrival on the scene			
Actually, the incident commander will use the primary to communicate with dispatch but all incident traffic will occur on the fireground channel. This is done to eliminate radio traffic on the main channel to keep it clear for any other calls that come in. Plus it helps focus the incident commander on the operations happening at the incident			
We switch to a secondary channel that merely is a talk around eliminating the repeater and the dispatcher's ability to hear fire ground traffic.			
Depending upon the complexity of the incident, multiple channels will be used.			
Continuity of communications.			
All radio traffic relating to a single incident is handled on the assigned FG channel. If another dispatch occurs for a multi-unit response, then another FG channel will be assigned and that one used for that incident. If a Mayday occurs, we have an SOG in place which directs the IC to request another FG channel for Mayday/RIT ops (although another FG channel may be requested for RIT ops alone). The Mayday SOG also states that the original FG channel must remain for the person who declared the Mayday and that all other personnel operating on the scene change to the newly designated FG channel.			
We currently only have (1) fire channel on our low band system. However we are switching to a 800 MHZ county-wide radio system in a few months and will then have access to multiple fire ground channels. We also run mutual aid with another county and we do utilize fire ground channels on their system.			
As much as possible.			
Because of the number of departments using limited number of frequencies.			
I assume you mean all radio traffic except when you go to FireGround Channel.			
We can have multiple calls going on with known of them being a working fire. Once a working fire is confirmed the use of the fireground channel comes into play.			
We only have 1 dispatcher, and our run volume is such that it works better for us.			
The police dept. dispatches our calls.			
Because everyone forgets to go to fireground, due to no SOP's I am assuming.			
Currently the main channel is the only one monitor by the dispatch center.			

	Response Count
There is only one small dept on it with us that runs about 150 times a year and see previous answer.	
We are a small 1 station department. Call volume does not dictate the use of more channels. If needed we do have access to 3 county channels and the 2 statewide fire channels	
Dispatch on one channel and operations on another.	
N/A	
The chief believes switching channels could cause confusion.	
no one has decided to commit resourses to another radio channel and the associated costs	
Yes, and NO All FG traffic for that incident is comunicated on this channel. All communications with the dispatcher takes place on the primary frequency.	
Yes, the main channel is the only repeated channel, and is used for all incidents. Dispatchers cannot monitor tacticals.	
we do have fireground channels, only used if multiple incidents	
chiefs decision	
we have very few incidents that generate large volumes of radio traffic, therefore we are out of the habit of thinking about changing to a tactical channel.	
We primarily use one frequency, however we have five additional countywide frequencies and one internal tactical frequency available if needed.	
Number of respondents answered this question	27

5. Who in your department initiates changing to a fireground channel?

			Response Count
[Comments are shown below]	[redacted]	100%	98
SOG			
IC			
Standing orders and OIC discretion.			
First arriving unit the on-scene of a multi-unit response.			
Assigned via dispatch or on request of IC			
Automatic on dispatch			
Any company officer or shift commander.			
The Incident commander.			
IC			

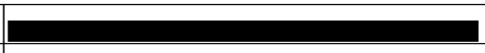
	Response Count
The incident commander	
Incident commander	
As stated above it is directed in our SOG's	
As stated above, dispatch assigns them to each call when 2 or more apparatus are sent. The shift commander or incident commander if not the same can request to be assigned one as well.	
It is done by policy. However we are currently switching to a county radio system. Firegrounds will be assigned by the dispatcher upon request of the IC or immediately if responding to a structure fire, entrapment or rescue situation where the likelihood of mutual aid is great	
IC	
Incident commander	
IC	
Battalion officer	
Incident Commander	
They do not unless they need another channel assigned or another run was assigned the IC can request a change. The dispatcher will assign upon dispatch.	
IC	
The I/C	
Incident commander.	
Whenever a incident requires a response of more than one unit, our County Dispatch automatically assigns a FG channel for that incident.	
Normally it is automatic upon arrival on scene. IC can used multiple fire ground channels if needed.	
Chief	
OIC	
When we respond mutual aid to Hamilton County, the county dispatch center assigns a fire ground channel as part of the dispatch.	
Incident Commander	
It is automatic. We reports on scene on the main fire channel, give a condintions report and command mode if first on scene, then all units/members are on fireground	
A fireground channel is assigned by the dispatcher with the dispatch.	
Dispatch protocol	
Procedures contained in SOG/SOP, rarely do system users require prompting. Typically, while conpanies are still en-route, somebody (a company commander, a battalion commander, or a dispatcher) will reiterate the FG channel.	
Our department has many of its own channels including a specific fireground channel that we may or may not be initially dispatched on-- The way I interpret this question is if we are dispatched on one channel, who initiates the change to another channel in the middle of a run? --Whomever is running IC or in some cases, our dispatching center has switched companies on one channel to another to another channel in the middle of a run	
Our Communications (dispatch)	

	Response Count
Incident commander	
The dispatcher automatically assigns all responding companies to 1 of 3 fireground channels when they dispatch a fire run. After that, only the IC can initiate the use of any other fireground channel, say for staging, as he/she sees fit.	
Command Officer, Apparatus Officer, or Dispatcher can assign	
Fire dispatch followed by confirmation of officer in primary unit	
On Dispatch a fire channel is assigned and Tac Channels per command request	
The initial IC as they report his/her size-up	
First unit to estxablish Command.	
See previous answer	
OIC	
O.I.C.	
OIC normally.	
Command	
Incident commander	
Fireground is assigned upon initial dispatch, additional channels can be asked for by Command if needed (i.e. Stagging, water ops, etc..) Two channels are reserved at all times for May-Day Ops.	
Incident command makes that determination	
Fire Command	
The Dispatch Center	
It is automatic per SOP on all fire runs. Should an incident need upgraded to a fire response the IC simply requests a FG channel from the dispatcher.	
The Incident Commander	
Incident Commander	
Incident commander	
The IC. However, it is policy in our region (Hillcrest) that upon arrival all units go to fireground channel. IC monitors primary dispatch channel as well as fireground.	
The IC.	
The incident commander or OIC.	
Typically the IC. The size of the incident as well may dictate seperate channels (water shuttle and staging come to mind first).	
IC or dispatch center if necessary with approval of IC	
The IC of any event.	
The BC	
IC	

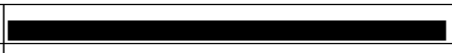
	Response Count
incident command	
The Incident Commander and it is SOP to move to tactical channel at a working structure fire Must be done prior to entry on fires	
The first arriving officer	
A fireground channel is assigned on every detail. ANy radio traffic, other than with Dispatch, automatically begins on the FG channel. Additional fireground channels can be assigned, ie. staging, by the incident commander.	
Incident Command will announce on the radio the "working" channel (usually in the same statement with the initial on scene size-up when Command is established and announced). It is usually the same simplex frequency and channel number designation for the entire county.	
incident commander if one is not assigned.	
Incident commande	
Standard porcedure	
OIC may request if warrented	
Incident Commander (following SOGs)	
It is automatic from our county dispatching agency.	
The incident commander, safety officer	
OIC	
Capt/Shift Commander	
At the discretion of the IC.	
The dispatcher, or the I/C can request add'l channels	
Alarm office and IC can ask to change to a different channel	
N/A	
Engine Co. officer when going enroute	
It is done so by SOP.	
Incident commander. The Dispatcher is authorized to assign (recommend) a tactical.	
OIC	
IC	
Incident Commander	
ic	
Dispatch	
Incident commander	
the incident commander unless dispatch requests it	
Generally, dispatch assigns a talkgroup when more than one unit is dispatched to a call. The OIC may request a FG talkgroup.	

	Response Count
Our Communications personnel.	
The dispatcher assigns a FG, and when that is done, we sue the FG talk group...	
The IC	
First in line officer or above.	
OIC	
Number of respondents answered this question	98

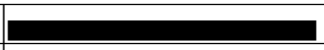
6. Does your department specifically train personnel on the technical use of the radio itself?

			Response Count
Yes		81%	84
No		19%	20
Number of respondents answered this question			104

7. Does your department specifically train personnel when to make the change to a fireground channel?

			Response Count
Yes		75%	79
No		25%	26
Number of respondents answered this question			105

8. Is the decision to change to a fireground channel part of the incident commander's initial size-up of an incident?

			Response Count
Yes		53%	55
No		47%	49
Number of respondents answered this question			104

9. Have your ever had to wait to transmit a message at the scene of an emergency that you considered to be critical, while the radio was tied up with radio traffic not related to the incident that you were at? (For purposes of this question, assume the term critical means that lives were in jeopardy or potentially in jeopardy.)

			Response Count
Yes		41%	43
No		59%	62
Number of respondents answered this question			105

Dispatch & Fireground Channel Assignment

Page 2

1. If you answered yes to the above question, then in your personal experience how frequently has such a problem occurred?

		Response Count
Very infrequently (less than once every five years)	14%	6
Infrequently (once every one to five years)	12%	5
Occasionally (approximately once or twice a year)	33%	14
Frequently (3 to 6 times per year)	23%	10
Very frequently (more than 6 times per year)	19%	8
Number of respondents answered this question		43

2. Do you believe the use of additional radio channels would:

		Response Count
Improve communications	82%	65
Hamper communications	3%	2
Neither improve or hamper communications	16%	13
Number of respondents answered this question		79

In answering the following questions, please assume the term "radio channel" refers to a setting on a radio, regardless of whether the channel is a simplex (single frequency) channel, duplex (two frequency) channel or trunked system. When counting the number of channels, do not count "talk-around" channels that are part of a duplex channel that has already been counted.

3. Does your department utilize multiple radio channels?

		Response Count
Yes	88%	86
No	12%	12
Number of respondents answered this question		98

4. If your answer to the above question was yes, please answer the following:

How many channels do you utilize in total?	Enter Number
5	
6	
4	
3	
13	
2	
8	
many ar available; use rarely more than 2 or3 at an incident.	
6	
7	
8	
1/2 Dispatch 20+ FG Channels Available	
4	
3	
3	
200	
2	
5	
11	
4	
2	
2	
5	
10	
5	
2 (Have access to 2 more)	
6	
8	
7	
17	
10	

21
03
4
27
4
2
21
6
2
ability to use 21 that are specifically assigned for FD use
286
Mostly 2
? 40 of 280
16
128
incident specific
2
2
40
3
3
4
4
4
12
28
5 +
6
5
depends but usually 2
3
2
5+

5	
3	
seven	
8	
5	
5	
4	
2	
2	
10	
28+	
1	
5	
2	
5	
typically 6	
5	
44	
26	
10	
30	
Almost unlimited	
12	
How many channels are used for dispatching apparatus?	**Enter Number**
1	
1	
1	
1	
1	
1	
2	
1	
1	

1
1
1 or 2 Depending on Time of Day
1
1
1
1
1
1
1
1
1
1
1
1
1
1
1
1
1
1
8
01
1
1
1
1
8
1
1
one (1)
1

1
1
1
3
1
1
1
1
2
1
1
1
1
1
2
2+
1
1
1
1
1
1
1
1
one
1
1
1
1
2
1
2
2

1	
1	
1	
1	
1	
1	
1	
1	
2	
1	
1	
1 for the western side of the county	
2	
2	
How many channels are used for fireground or tactical purposes?	**Enter Number**
4	
4	
2	
4	
1	
6	
many are available...	
5	
up to 7	
7	
20 FG Channels Plus Multiple Tactical Channels and other Frequencies	
1	
1	
2	
1	
1	
4	
10	

3
2
1 to 2
4
2
4
1 (have access to 2 more)
3
2
5
8-16
9
5
02
2
26
2
1
5
4
1
two (2)
2
1 of several
8 normally
9
10
incident specific
1
1
40
50+
2

2
3
3
3
26
1+
5
3
depends, 3 are available
2
1
4
4
1
six
7
4
4
3
As many as necesary
2
7-8
28+
1
depends, MAC,MERC,Etc
1
2
3
5
20
5
1
9

24
3
11
Number of respondents answered this question 89

5. Does your department utilize a separate "mutual aid" channel in addition to those listed above, in order to communicate with neighboring departments?

			Response Count
Yes	[redacted]	52%	50
No	[redacted]	48%	47
	Number of respondents answered this question		97

6. If yes, how many mutual aid channels does your department use?

			Response Count
[Comments are shown below]	[redacted]	100%	51
multiple			
3			
3			
1			
we use an 800 system and are assigned on dispatch			
1			
6			
1 in our system, multiple in the county system			
2			
4			
4			
many! I think our digital radios handle 255 talk groups ; all 800, hi-band, Marcs; so, 255-21=234 MA give or take			
1			
26			
4			
many! I think our digital radios handle 255 talk groups ; all 800, hi-band, Marcs; so, 255-21=234 MA channels give or take			
4			

	Response Count
We have their tak groups and they have ours	
283	
40	
32 (different banks)	
10	
1	
25+	
1	
2	
We carry 800 MHz portibles for MA companies not on our freq.	
5	
County-wide system	
5	
1 - but we can patch mutual aid companies to our radios	
6	
5	
7	
We have 2 mutual aid channels, we do not use them unless they are from a county outside our that we cannot patch.	
10	
1	
28+	
1 in county-separate radio outside the county	
a dozen or more each, MAC, MARC, MARC2, MERC	
800 Marks system so lots	
12 per group, I believe	
3	
4	
15	
10	
0	
4	
6	

	Response Count
26	
for other departments that do not use the county frequencies we have thier frequency if possible.	
Number of respondents answered this question	51

7. Are all of the radio channels used for dispatch, fireground, and tactical purposes, monitored continuously by dispatch personnel when being used?

			Response Count
Yes	[redacted]	40%	39
No	[redacted]	60%	58
	Number of respondents answered this question		97

8. If your answer to the above question was NO, please explain which radio channels are not monitored by dispatchers:

			Response Count
[Comments are shown below]	[redacted]	100%	58
our dispatchers only monitor fire 1 & 2 channel 3,4,5 are desingnated portable only by the FCC			
Out of county and out of state			
Only dispatch channels are monitored by dispatch (I believe that this hampers the decision to switch to a tactical channel sooner)			
Dispatcher monitors "primary" disp talk group and tries to monitor talk groups assigned to working incidents.			
Dispatch, TAC 4, TAC 5 & TAC 6 - Monitored TAC 3, TAC 7, TAC 8 & TAC 9 - Not Monitored			
Only Dispatch Channels are Monitored per County Dispatch SOG			
Firegound ia low wattage and for radio-to-radio on fireground. The IC monitors both channels.			
Dispatcher only monitor the dispatch talk group			
Only dispatch and our main channel are monitored by 911. Our tactical channel is not monitored.			
Primary Fire Dispatch			
Our fireground channel is currently a simplex, non-repeated channel and unable to be monitored by dispatch.			
We use a low watt tactical channel that cannot be picked up outside of a 1/2 mile radius. This is an issue currently being worked on			
Fireground channel does not go through the repeater			
Dispatch only monitors the dispatch channel			
Only the dispatch channel is monitored.			

	Response Count
They are all recorded, but not necessarily audibly monitored if multiple incidents are occurring simultaneously.	
The fireground channels are not specifically monitored by dispatchers.	
Niether the fire ground channel nor the water shuttle channel is monitored by dispatch.	
Simplex and can not be monitored sometimes we are too far away.	
Dispatch has the ablity to monitor our fireground if the scene is close enough to dispatch. Outer limits of the city portable traffic may not be heard. 2 additional channels we could use would not be monitored.	
Fire ground tactical channels are for working crews to comunicate with IC and each other	
The primary dispath channel is recorded and monitored by the dispatchers. The dispatchers have the option to monitor FG channels, but do no often do so.	
they monitor dispatch only	
The fireground channels are short range Dispatch most times canot pick it up	
The channels that are not monitored by our dispatchers are all of the channels with the exception of the main dispatch channel.	
They are able to monitor all the channels, but they usually only monitor channels with a "significant" incident.	
Communications only monitor FD Dispatch. This is our primary dispatch talk group.	
Most are not monitored. This is because they are not used on a regular basis by the emergency personel and the dispatchers can only listen to a limited number of channels at a time.	
Some tactical channels are not monitored and ussed for water supply ext. FG command channels are monitored with an assigned dispacther.	
Depending on which dispatchers are on duty will determine how closley they are monitores. The channels are supposed to be monitored.	
It has to do with training of Regional Dispatchers and in some cases the way the system was designed	
Only dispatch is monitored by the dispatcher	
We utlize a talk-around channel (Channel 2) during fire incidents that is on the same frequency, but not on the repeater system. Therefore our dispatchers can't hear it. We have to switch to Channel 1 to have the dispatcher hear us.	
All are NOT monitored except dispatch and mayday channels.	
Fire ground and other departments home freq.	
Primary is always monitored, other channels may be monitored if dispatchers are no busy with SO traffic or other FDs.	
Dispatchers stay on channel one but can monitor two and three	
In Hamilton County, we have 41 fire agencies using 26 fireground channels. There are times that several incidents are happening simultaneously, thus the fire dispatchers can not monitor every talkgroup continuously.	
When dispatchers are not tied up on calls they can monitor all the channels but they are not required to	
We are switching to 800 so again, this is a complicated question. Under our old system, dispacth can monitor only 2 channels. Dispatch and primary fireground. However, this can be changed to ANY 2 channels.	
Just the main frequency and 1 fireground channel. Dispatch cannot monitor mutual aid channels until they are patched together at the scene.	

	Response Count
Fireground.	
only dispatch channel monitored	
There are 6 county tactical channels which are not monitored all communications to and from dispatch are monitored	
dispatch can only monitor the primary and one tac channel at a time	
We have two channels that are monitored by the dispatcher. The other three the dispatcher can not monitor.	
The fireground and other tactical channels are not monitored by the dispatch center. We have one channel that is setup as an Emergency channel which dispatch does monitor.	
The primary channel used for Fireground is monitored. The three other channels are not monitored by our PSAP dispatch but are in another PSAP in the county, providing they can receive the simplex frequency from our portables/mobiles from our working location.	
We have the ability to switch between primary and secondary channels. Our system has more channel flexibilty than the dispatchers console has to "listen" too. The dispatcher keeps certain channels monitored constantly. If we are going to operated on a secondary channel for a 'working' incident vs. "when you're at the store get extra cheese" then we let the dispatcher know so they can key it up and tune in.	
Primary channels for dispatching are monitored closely. Fireground channels are usually monitored, unless dispatchers are too busy. Priority for monitoring the FG channels when the incident is more critical.	
A few are monitored continuously. Most are monitored when assigned. In addition, there is a dedicated emergency channel, activated by the orange emergency button that is monitored continuously.	
Dispatchers, by policy, are to monitor only the dispatch channel and "Help" talkgroups. Emergency buttons (Mayday) override that feature. Unofficially, dispatchers are known to monitor fireground talkgroups.	
Depending on how "Busy" our comm center is dictates the channel being monitored	
Tac. channels are not normally monitored unless they are being used.	
Our county dispatch will monitor the the dispatch channel and at least one fireground channel. The firegroun channel is based on their staffing and the call volume. It is not always monitored.	
There are four repeated dispatch channels that are used in different sections of the County. Tacticals are not repeated or monitored.	
City dispatch only monitors the 1 city channel for fire. they are not capable of monitoring more channels. upgrade is needed for a fireground or any other channel	
I'm not sure of the dispatchers protocol of when to listen to certain channels.	
Number of respondents answered this question	58

9. What steps (if any) does your department take to ensure that critical fireground messages (such as a "Mayday" message, or a building evacuation order), are properly transmitted, received, acknowledged and/or acted upon when using unmonitored channels?

			Response Count
[Comments are shown below]		100%	87

	Response Count
Tom...email me at loboschefski-brandon@maumee.org...I'd like to talk to you about your research...I teach a comm. class at Owens College. Thanks!	
All messages are repeated. Incident commanders are responsible for monitoring off channel frequencies. 911 dispatch also monitors all frequencies.	
Fire ground chanles are monitored by comand	
All channels are monitored by Communications personnel.	
None	
We do not use unmonitored channels.	
adds to command staff through planned dispatch of assisting chief officers from neighboring departments...	
SOGs were developed and the 800 system engineered wih banners	
Most fireground operations use the TAC 6 frequency which is monitored by dispatch. The IC or a Division Supervisor is responsible for monitoring the TAC frequency.	
It is incumbent on the IC to monitor for these types of communication	
Responsibility of Incident Commander	
Mayday is also broacasted over fireground channel	
Falls on teh IC	
The statement "Emergency Traffic" is used for critical messages, then all personnel understand that you are to observe radio silence until the situation is transmitted to the OIC.	
Emergency button activations are broadcasted on the primary dispatch channel.	
A building evacuation message on the radio is followed by 3 truck horn blasts of 3 seconds each.	
The confirmation is the responsibility of the IC and/or designated Safety Officer	
Training.	
Thru policys, training and the emergency button automatically converts to the primary channel when activated	
Responsiblity is on the IC to listen for the radio traffic.	
SOG on Mayday Operations	
The I/C remains in contact with the dispatchers and operations remains in contact with those working in the hazard zone. We attempt to verify all messages.	
Closely monitor tactical channels	
We only talk to dispatch if we need something from them. They don't monitor all the channels.	
The command vehicle has two dedicated radios that stay on each freq on the emergency scene. Also multiple officers monitor monitor both channels as well. Not fail safe but works well for us.	
Emergency activation "may day" button on each radio	
NONE	

	Response Count
Although, our dispatch agency doesn't routinely monitor FG channels, they are recorded. To ensure a message is heard and/or received the IC must have two radios (one to monitor the assigned FG and the other to listen the County). All members of the department are told and re-told to be actively listening to the radio just in case something is transmitted by not readily heard by someone important. We train on 'calling a Mayday' and we routinely train on our Operational Communications SOG. Even though our dispatch agency doesn't monitor FG channels, all personnel operating on our scenes who are not acting in an IC capacity are on the assigned FG channel. That puts many ears listening to radio traffic for that incident.	
No specific steps.	
We try keep Main Ops channel open	
The only channels we have that our dispatchers don't moniotor constantly are our 3 training channels. None of these channels would be used in a fireground situation.	
WE have and train on a mayday SOP. Our radios have alert tones built in. Our officer radios ID who is transmitting and all radios have a mayday alert button. We also use MDTs, GPS and AVL in all our vehicles. Some of our dispatch communication is conducted on the MDTs, to free up the main dispact channel.	
We have our Incident Commanders monitor multible channels by either scanning or using more than one radio	
We have 2 channels that are used for Mayday only. If a Mayday is called, all companies switch to a Mayday channel except for the crews working the fireifghter rescue situation.	
Dispatch acknolwedgews the fact and all others move to the Mayday channel to continue operations.	
ALERT TONE	
The only channels we have that our dispatchers don't moniotor constantly are our 3 training channels. None of these channels would be used in a fireground situation.	
It is stated in an S.O.P. that all radio traffic preceeded by either "Mayday" or "Emergency Traffic" shall be given immediate radio clearance.	
sog and policy	
Incident Commander see's that communication sets off a alert tone and IC follows up with a par.	
Once a mayday is called, SOP's dictate that all non - mayday traffic goes to another channel	
We opperate Moterrola xts 5000R radios on Digital 800, simplex 800 and Marcs and can only scan one system. Maydays are called on the FG Channel or Emergency Banners go to the dispatch Channel	
We have an emercency button that is to be actiavted in the event of an emergency. All personnel are trained in the LUNAR method of declaring a Mayday.	
Command Radios have all-call frequency that allows for this transmission	
County-wide SOP cover what happens in these situations	
Until we switch to the 800 MHZ system, there is no way to ensure this happens.	
It's backed up by audible horns and then followed up by a PAR.	
Totally adopted fire ground S.O.P. for building evacuations and Firefighter Maydays. Utilized by both the Fire Deaprtments and the County 9-1-1 Center. Specific tone over the radio channel to duplicate the O.I.C order of Evacuation or a declared Mayday.	

	Response Count
Using the Scan feature.	
Highest priority, policy driven, county & mutual aid aggreement.	
We don't use a freq. that is not monitored for crews inside.	
This is a policy we have. If a mayday is transmitted, all non mayday traffic is routed on the second tactical frequency. Mayday are acknowledged by the IC, and monitored by dispatch	
Repeat messages. County wide 800MHz system is in developement.	
Mayday is repeated over the radio and everyone is supposed to clear the channel and listen	
The firefighters and incident commmanders are trained to deliver and receive a MAYDAY. There are two separate talkgroups set aside for working units to move operations to in the event of a MAYDAY. The emergency button on the radios is also available to the firefighters which moves them back to the main dispatch talkgroup to delvier a MAYDAY.	
All Radios are on dedicated monitored Fireground channels during all operations.	
We have a a channel assigned for that purpose	
It's left up to the incident commander and policies direct his actions	
MayDay traffic gets priority. Again, this is established in our region that all NON MAYDAY traffic go to secondary fireground channel. The mayday stays on primary fireground and confirms with IC or RIT/Rescue Officer. Dispatch has the ability to monitor the 2 channels so there is a chance they will catch the emergency traffic if the IC misses it. Primary fireground is a non-repated channel.	
Unfortunately nothing	
I.C. announces "emergency traffic, all units stand-by".	
Mayday procedures are reviewed in training	
IC stayes in the vehicle to run a incident. That seems to help with listening and plus they are not bothered by people coming up to them. Also it provides of radio channels to have and listen to.	
Through our radio SOP.	
firegound channels monitored by on scene personnel	
There are 6 county tactical channels if a mayday is sounded all traffic can be shifted to another tac channel	
IC monitors all of the channels on multiple radios	
Our mayday uses an alert button that gives them the radio frequency priority and kicks them back to the dispatch primary channel. It's preprogrammed in our radios.	
During a Mayday all other fireground radio traffic is moved to a seperate frequency.	
When a firefighter is in troble, we have an Emergency Channel that dispatch does monitor. When the Emergency Channel has been activated the dispatcher will inform the IC over the main dispatch channel.	
First, anytime a radios 'emergency banner' is activated, it defaults to the Counties primary dispatch channel as a default. Second, it is the responsibility of the IC to advise the diapatcher anytime a channel not assigned by them is to be utilized.	
Most of our tactical/fireground is on the additional channel monitored by our dispatch. It is rare that we would have interior operations on another frequency.	

	Response Count
Understanding that, if the Incident Command does not acknowlege the MADAY, the pump operator is monitoring, regardless of the working channel he may be on, and will notify the Incident Commander.	
Department SOGs (based on standard SOGs adopted by the Hamilton County COmmunications Center and Hamilton County Fire Chiefs).	
None other than dispatch and thoseon the fireground	
SOP/SOG, training on these procedures, awareness by all listeners/users	
SOG, Practical training, and multiple folks listening and ready to act on transmissions should one or some miss it (dispatch, command, RIT, etc.)	
Switch to main dispatch and transmit as needed	
There is an SOP fot thiese particular incidents. The messages are repeated, channels are cleared	
Emergency buttons cause an alert at the dispatch console identifying the originating radio. There is a procedure in place to contact the FG Commander with the radio number and request a status verification. Non-Emergency Button Mayday calls are not expected to be monitored by the dispatcher, officially.	
We use an "annouce channel" this tarnsmits to all chaneels used by our department. We then conduct roll calls off all fire ground personnel/crews	
we have specific mayday channels on the radio system. Echo, we make sure all personnel and radio operators are aware of the situation.	
The have a SOG that describes the difference between emergency traffic and a matday situation.	
Incident commander only.	
incident command is responsible for clearing traffic and repeating all critical transmissions	
SOP and training. Once a Mayday has been called for, then operations move to a different channel and mayday ops stays on the initial channel.	
Follow SOG and continous monitoring by IC, SO and dispatchers. We do not use unmoinitored channels.	
we very seldom use channels 3,4,5	
Number of respondents answered this question	87

Dispatch & Fireground Channel Assignment

Page 3

1. What factors prevent your department from utilizing a fireground channel?

	Check if Yes	Response Count
Lack of a fireground channel	100% (2)	2
Current equipment does not support use of secondary channel	100% (3)	3
Training personnel to use a fireground channel	100% (8)	8
Lack of a SOP/SOG determining the use of a fireground channel	100% (12)	12
Use of a fireground channel is too complicated for personnel	100% (1)	1
Dispatch unable to monitor a fireground channel	100% (16)	16
Too few dispatch personnel to monitor more than one fireground channel	100% (19)	19
Number of respondents answered this question		31

2. To the best of your knowledge, has your department ever had a firefighter killed or injured at an incident scene where the fact that the radio channel was too busy with other radio traffic was found to be a contributing factor?

			Response Count
Yes		2%	2
No		98%	93
Number of respondents answered this question			95

3. To the best of your knowledge, has your department ever had a firefighter killed or injured at an incident scene where the lack of monitoring of the radio channel by dispatch personnel was found to be a contributing factor?

			Response Count
Yes		0%	0
No		100%	95
Number of respondents answered this question			95

4. What type of radio system do you operate?

	Check All That Apply	Response Count
UHF Simplex/Duplex (repeater)	100% (19)	19
VHF Simplex/Duplex (repeater)	100% (39)	39
800 MHz trunked	100% (56)	56
other trunked	100% (4)	4
other	100% (8)	8
	Number of respondents answered this question	96

Please answer the following questions about your fire department.

5. What is your population served?

	Check One Only	Response Count
Less than 10,000	100% (14)	14
10,000 to 20,000	100% (30)	30
20,000 to 50,000	100% (37)	37
50,000 to 100,000	100% (16)	16
	Number of respondents answered this question	96

6. What is your department type?

	Check Only One	Response Count
Fully Paid,	100% (42)	42
Combination	100% (48)	48
Fully Volunteer,	100% (6)	6
	Number of respondents answered this question	96

7. What type of community do you serve?

	Check Only One	Response Count
Rural	100% (17)	17
Suburban	100% (71)	71
Urban	100% (10)	10
	Number of respondents answered this question	95

8. How many total responses does your department handle annually? (Please include all fire department responses including fire department emergency medical responses if provided, hazmat, service calls, false alarms, etc.)

			Response Count
[Comments are shown below]		100%	95
5,000			
3150			
approx. 37,000/yr			
350			
1650			
2950			
2100			
220			
1800			
1841			
900			
6600			
4500			
1,625			
4500			
700+			
70			
1,000			
1650			
2500			
2300			
1350			
1900+			
aprx 4,000			
About 2800			
12,000			
2500			
400			
4100			

	Response Count
4000	
3,500	
4,036	
450	
3000	
4000	
1100	
962	
5500	
1,900	
980	
aprx. 4,000	
5000	
1702 last year	
6200	
13,000 unit responses	
750	
5500	
1100	
1650	
250	
10	
2300	
3100	
6062 in 2008	
7,100	
6000	
2300	
2100	
7,550	
1800	
1460	

	Response Count
2000	
1400	
1,300	
1900	
675	
1950	
4400	
2,200 to 2,300	
100	
approx. 6,000	
2980	
5000+	
1600	
3200	
7500	
8200+	
2000	
4,000	
4333	
~6,000	
1600	
3800	
8200	
1400	
6000	
1965	
3,850	
3000	
7000	
approximately 3600	
10,000	
2000	

	Response Count
8000	
1150	
Number of respondents answered this question	95

APPENDIX THREE - FIGURES

Figure 1

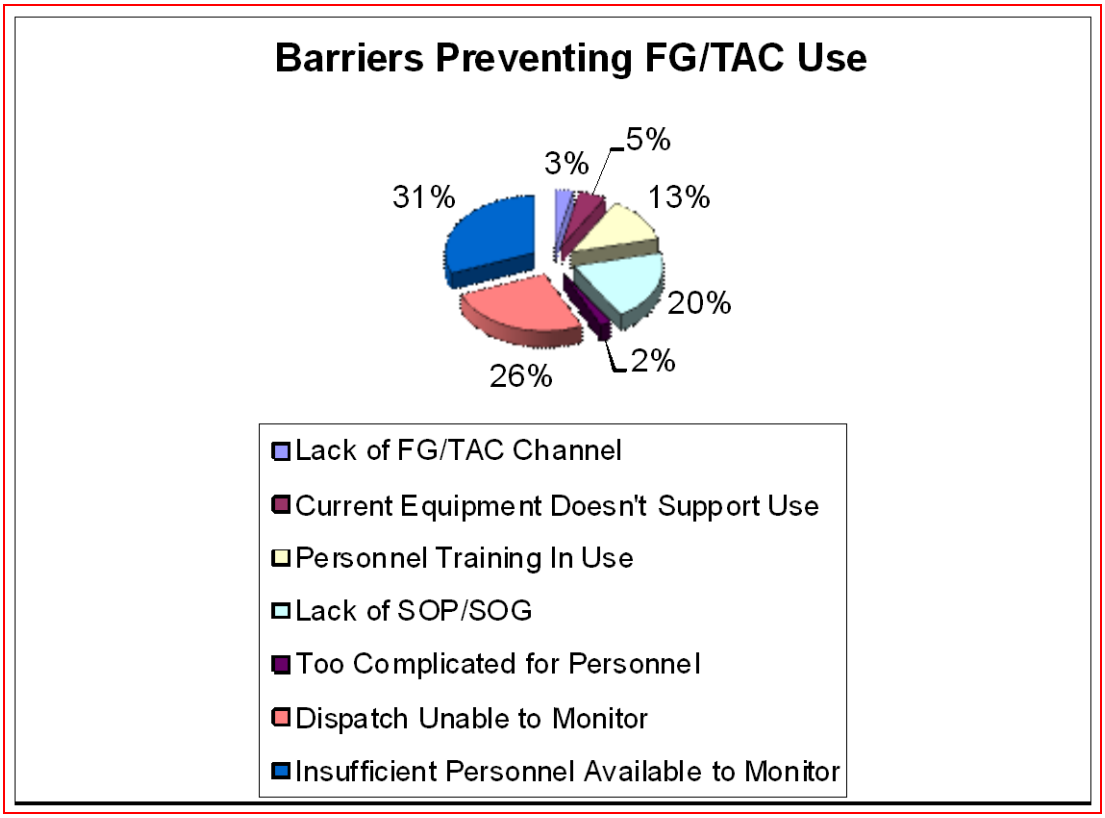


Figure 2

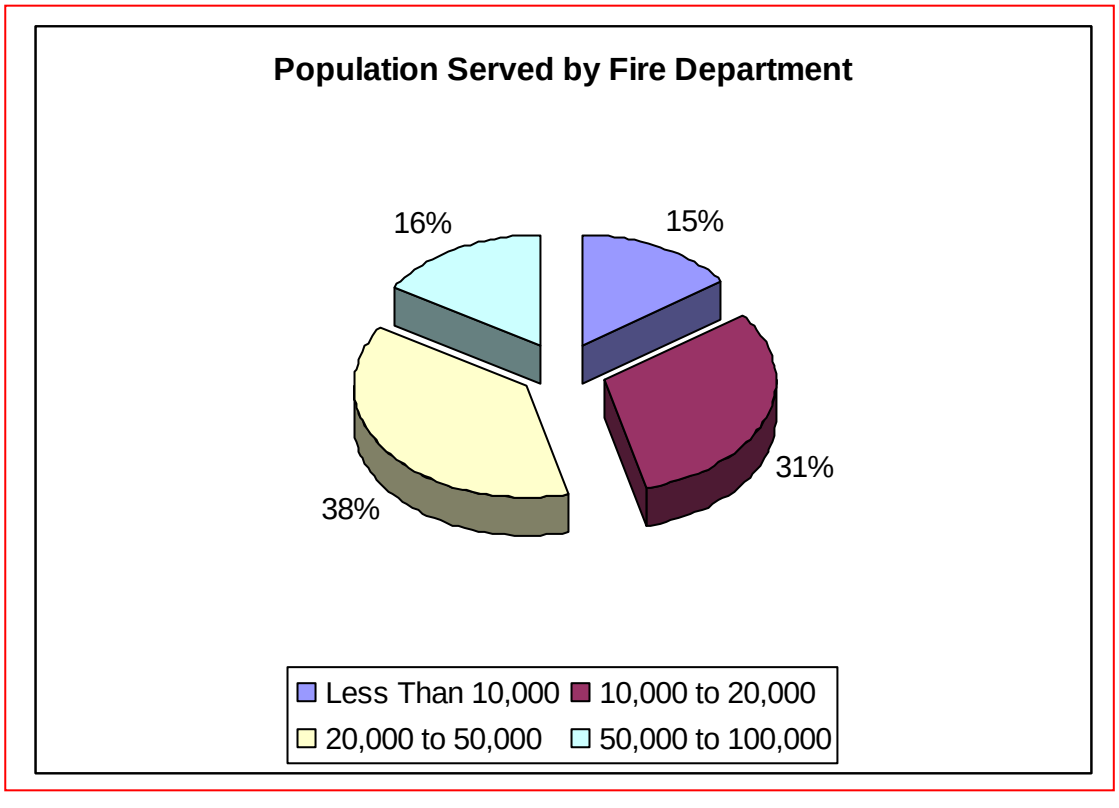


Figure 3

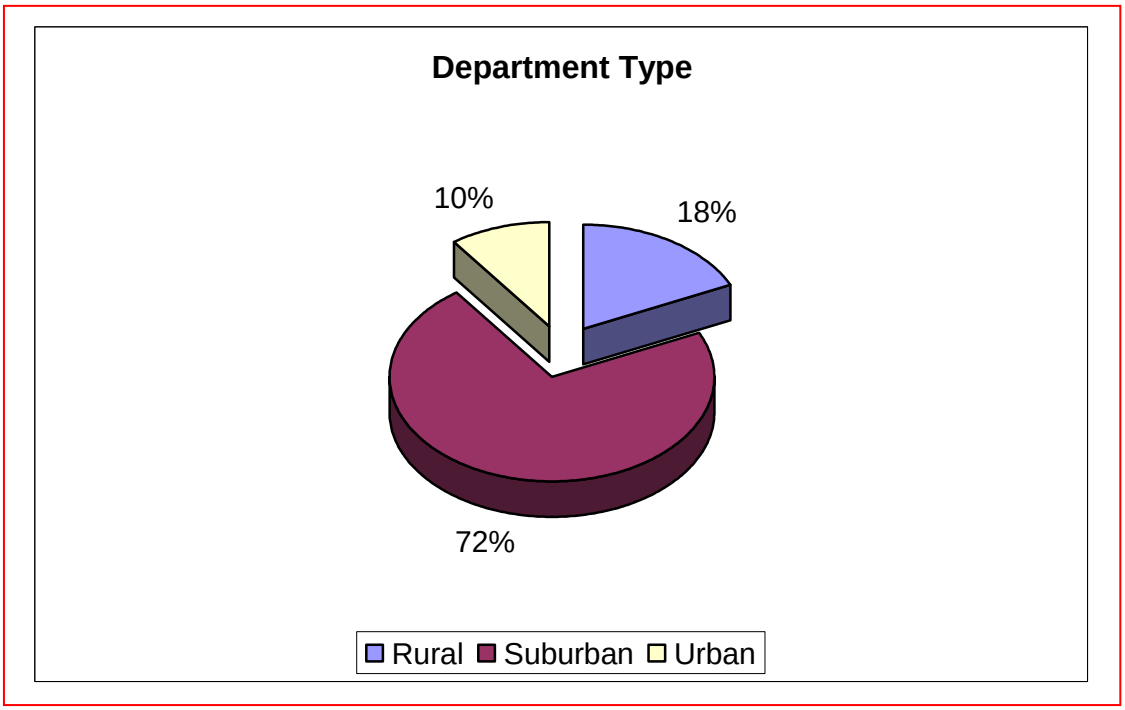
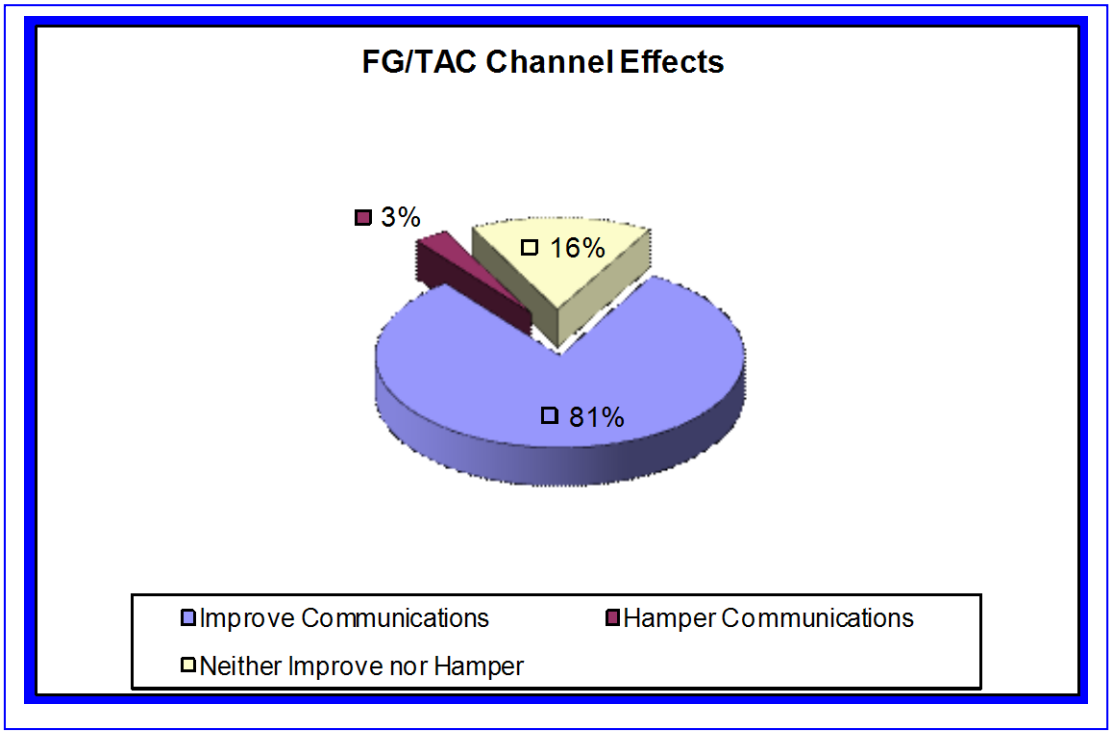


Figure 4



APPENDIX 4 – FG/TAC SOP/SOG

	Middleburg Heights Fire Department	
	Subject: Use of Fireground-Tactical Channel.	**SOG#:**
	Category: Radio Communications	Initiated:
	Approved:	Revised:

Purpose

The purpose of this SOG is to assist in providing a common interoperable communications channel amongst all safety personnel responding to incidents that out-resource the current on-duty shift personnel.

Scope

This guideline applies to dispatch personnel and all employees of The Middleburg Heights Fire Department who operate on any emergency incident scene. This guideline applies to both fire and EMS incidents.

Guideline

On any fire or EMS incident that either begins or escalates to the point that out-resource our on-duty personnel and a recall of off-duty personnel, a request for mutual aid companies or both presents, the officer in charge (OIC) shall have all responders change to TAC-6 for radio communications. The OIC should broadcast a message to all personnel starting on the dispatch channel by stating i.e.: *"Command to all personnel, switch to TAC-6. All further fireground communications will be on TAC-6"*.

The OIC should also contact dispatch to verify that they are monitoring TAC-6, also. Mutual aid responders will be advised by dispatch when requested, that communications are being conducted on TAC-6. Communications on TAC-6 will continue until the end of the incident unless directed by the OIC.