An Evaluation of Reverse Notification as a Public Alerting and Communication Tool for the Minneapolis Fire Department

Executive Analysis of Fire Service Operations in Emergency Management

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An applied research project submitted to the National Fire Academy as part of the Executive Fire Officer Program

April 2005
CERTIFICATION STATEMENT

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

Signed: ________________________________
ABSTRACT

The problem is that the Minneapolis Fire Department does not have an effective means of communicating time critical information to the public in both residential and commercial occupancies in the event of an emergency.

The purpose of this applied research project is to evaluate reverse notification as a public alerting and communication tool, and to compare it to existing communication methods currently used by the Minneapolis Fire Department to inform the public on emergency incidents that may occur in the city. The following research questions were asked:

1. What methods are utilized by communities for effective mass notifications to evacuate or shelter in place?
2. What information is provided to community residents in order to prepare for an evacuation or to shelter in place?
3. Would a reverse 911 notification system be an effective public alerting communication tool in directing residents to evacuate or shelter in place?
4. What training would the community need to understand the reverse 911 notification concept?

Evaluative research was conducted. An extensive literature review was performed. Survey instruments were sent to Fire Departments and Emergency Managers around the State of Minnesota.
Results identified a variety of responses that included:

- Most communities use similar methods for effective mass notification.
- The community needs to know specific information in order to prepare to evacuate or shelter in place.
- Reverse notification is an effective public alerting and communication tool.
- The community needs to be educated about reverse notification.

Resulting recommendations included (a) continuing with current community alerting methods such as EAS, sirens, media and door to door, (b) raising public awareness about reverse notification, and (c) exploring the option of reverse 911 notification.
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INTRODUCTION

Communicating emergency information or warnings in a timely manner provides a constant challenge. Currently, the City of Minneapolis communicates this information in several formats including the use of 32 storm warning sirens, although none of which have the capability of voice transmission along with siren activation. The Fire Department may also utilize the resources of the Emergency Alert System to notify the community in the event of severe weather or other hazardous conditions. And the Fire Department may use the resources of local and regional media to make that notification even though that may not be as effective, as it relies on having people constantly in tune with those media outlets.

The problem is that the Minneapolis Fire Department does not have an effective means of communicating time critical information to the public in both residential and commercial occupancies in the event of an emergency.

The purpose of this applied research project is to evaluate reverse notification as a public alerting and communication tool, and to compare it to existing communication methods currently used by the Minneapolis Fire Department to inform the public on emergency incidents that may occur in the city.

Using evaluative research methodology, this applied research project will attempt to examine the issue through a variety of methods including (a) identifying through literature review and historical research the methods that are utilized by communities for effective mass
notifications to evacuate or shelter in place; (b) identifying through literature review and historical research what information is provided to community residents in order to prepare them for evacuating or sheltering in place; (c) surveying the fire agencies and emergency managers throughout the state to see if they are presently utilizing reverse 911 notification; (d) evaluating the effectiveness of a reverse 911 notification system as a public alerting communication tool in directing residents/occupants to evacuate or shelter in place; and (e) considering what type of training the community would need to understand the reverse 911 notification concept.

Material presented at the National Fire Academy's (NFA) *Executive Analysis of Fire Service Operations in Emergency Management (EAFSOEM)* course will be applied (see the "Background and Significance" section for an explanation of the relationship between the research and the course material). The specific research questions to be addressed are

1. What methods are utilized by communities for effective mass notifications to evacuate or shelter in place?
2. What information is provided to community residents in order to prepare for an evacuation or to shelter in place?
3. Would a reverse 911 notification system be an effective public alerting communication tool in directing residents to evacuate or shelter in place?
4. What training would the community need to understand the reverse 911 notification concept?
BACKGROUND AND SIGNIFICANCE

Minneapolis Fire

The Minneapolis Fire Department is a full time professional emergency service organization with an authorized strength of 421 sworn employees and 22 civilians. The department provides emergency response and risk prevention related services for a metropolitan population of 382,618 people located over 59 square miles. Minneapolis firefighters responded to 32,630 calls for emergency service in 2004. Emergency medical events accounted for 65 percent of all calls for service. The current average response time is 3 minutes 38 seconds for an emergency call. The Minneapolis Fire Department is adequately staffed and equipped to handle emergencies that routinely occur within the City. The department is diversified in firefighting, public fire education, emergency medical services, rescue operations, building inspections and emergency preparedness activities. The department also specialized in hazardous materials response, trench and high angle rescue, confined space rescue, swift water rescue and structural collapse rescue. Despite this diversity, the Minneapolis Fire Department can quickly be overwhelmed in a disaster situation and may not be able to communicate time critical information to the public in the event of an emergency.

The City of Minneapolis stands to be a potential site for both a natural disaster as well as a man-made disaster. In the past, the City has succumbed to damage from high winds and small-scale flooding during the summer months and high winds, snow, and ice in the winter months. Not to mention the fact that Minnesota is known to endure a small number of tornadoes every
summer. These natural disasters can tax the agency’s resources and emergency calls for service can become stacked until such time that units are able to respond. In addition, damage assessments can be delayed due to lack of personnel and resources. While natural disasters and their damage pose a threat to the daily operations of any fire department, man-made disasters also pose a threat that could potentially overcome the current resources. In Minneapolis, one of the greatest potentials for damage from a man-made disaster lies within the shipment of hazardous materials on the thoroughfares and railways. While the probability of a large-scale event is low to moderate, the potential for damage to life, property and the environment is high. The volume of hazardous materials traffic on the 3 major highways that surround the City of Minneapolis is consistently high and the amount of hazardous materials that is shipped through the rail yard that sits on the northern end of the City is significant. Two such hazardous materials incidents did occur in the City in 1995 and 1996. In 1995, a warehouse of chemicals burned to the ground at the Hawkins Chemical Company and in 1996, there was another fire at the same facility that resulted in a large-scale release of calcium hypochlorite and powdered chlorine. The chemical release resulted in the evacuation of adjacent neighborhoods and taxed the resources of the Minneapolis Fire Department almost beyond their limit.

The Warning and Notification Annex of the Emergency Operations Plan for the City of Minneapolis charges the Minneapolis Emergency Communications Center, in conjunction with Minneapolis Emergency Management with the responsibility of issuing warnings and notifications to key city officials and the general public. Minneapolis employs traditional methods of notification in an emergency situation, EAS, sirens, media notification and door to door notification.
Since we already know that such wide spread emergencies will occur in Minneapolis, and based on past experience from the two Hawkins Chemical incidents, we know we cannot provide community notification to the affected areas in a timely manner. Because of those experiences, we should be looking to explore alternate notification methods for our community. Fire departments nationwide have instituted layered community notification methods as part of their overall disaster response plans. Recognizing the need to provide alternative methods of notifying the public during large scale emergencies, many fire departments and emergency managers are exploring the concept of reverse 911 notification.

This research is being conducted as a required component of the Executive Analysis of Fire Service Operations in Emergency Management (EAFSOEM) course in the NFA's Executive Fire Officer Program (EFOP). The issues being studied are related to several concepts presented in the course under Unit 1 “Introduction”, where the terminal objective is to analyze the department’s level of preparedness for the fire service and community in emergency management; Unit 3 “Community Risk Assessment/Capability Assessment”, and Unit 4 “Developing Resources and the EOC”, specifically the enabling objectives that include “identifying capability shortfalls in a community” and “describing the major issues a community may face during an emergency response to a large scale incident”.

Keeping in mind one of the five United States Fire Administration Operational Objectives of promoting within communities a comprehensive, multi-hazard risk-reduction plan led by the fire service, this paper will try to evaluate the use of reverse notification as a public
alerting and communication tool and compare it to existing communication methods currently
used by the Minneapolis Fire Department to inform the public on emergency incidents that occur
in the City of Minneapolis.

**LITERATURE REVIEW**

A literature review was conducted using the National Fire Academy’s Learning Resource
Center, the Internet, and personal interviews conducted in person as well as by phone.
Information was obtained from organizations associated with the fire service and emergency
management, as well as some organizations not associated with the fire service or emergency
management. Trade journals and previous Executive Fire Officer Program (EFOP) papers were
utilized. Research that analyzed the use of reverse notification as a public alerting
communication tool was reviewed. Research that included the concepts of evacuation and
sheltering in place as well as effective risk messaging were also reviewed.

**Community Alerting Systems**

In a special report for *9-1-1 Magazine* Larson points out that initial disaster warning systems
came in the form of the air raid sirens of the 1940s and 1950s. Originally developed during
wartime to alert communities of air attack, these warning systems were adapted for use during
peacetime disasters. Today, many communities across the United States still rely on this
technology to provide warnings to the community in the event of severe weather and other
dangerous or hazardous conditions even though traditional sirens are often confusing and not
always heard inside buildings. The article quoted Disaster Warning Network founder John Flanagan, “Community Alerting Systems all do a very ineffective job of properly warning the populations that they are designed to protect. All the systems use technologies that are at least 50 years old (sirens, telephones, radio and television alerts). These systems require one to be in hearing range, to be awake, or to have a device turned on” (p.76).

The Phoenix Fire Department’s Standard Operating Procedures (1996) on evacuations indicates that because time and resources may not be available for door-to-door notifications, sirens, air horns, and public address systems may speed the alert process.

The old Emergency Broadcast System has been replaced by a newer Emergency Alert System reports LeBow (1996) in the *APCO Bulletin*. The new system was mandated by the Federal Communications Commission (FCC) for all television, AM radio, FM radio, and cable systems by July 1997. LeBow also reports that with the new encoders and decoders that go along with the system, “it will be possible to get emergency messages out to the public within seconds without having to make telephone calls to radio or TV stations” (p.76).

*The Journal of Civil Defense* (“The Emergency Alert System,” 2000) also reports on the new Emergency Alert System. This article indicated that digital messages sent out to broadcast or cable stations can be converted, presumably by a computerized text reader, into any language.
Still, there are problems using radio to alert people. One problem pointed out is that radio covers a broad area and goes into areas not at risk. Further, it reaches only a small portion of the people during late night hours. Television suffers from the same disadvantage (Mileti & Sorenson, 1990, chap. 3, p.14). After a certain number of false alarms, many will choose to ignore the warning.

Even though these messages may also be disseminated through the efforts of local media outlets it still requires the general population to have those media resources turned on at all times to ensure that they receive those messages. Therefore, communicating emergency information and warnings to the public in a timely manner still proves to be a constant challenge.

In the article *Community Alert Systems* Larson (2000) it quotes Qwest as saying, “community alerting is a powerful tool that maximizes a public safety agency’s ability to deliver critical information to the citizens under its protection in a targeted, rapid and accurate manner…and that community alerting systems provide an efficient, effective method to proactively notify citizens of impending danger and give detailed instructions of required action, which can lessen potential harmful effects” (p. 76)

**Evacuation versus Sheltering in Place**

In rare instances, hazardous materials are released in the air, Residents may be asked by police and fire officials to either evacuate or shelter in place, depending on the situation. It is important to be prepared for both. (City of Minneapolis, 2001)
Evacuation is a major undertaking in any community, with problems compounding as the population density increases, such as in metropolitan areas (Fire Chief, June 1989, p.40).

Sheltering in place is a technique for minimizing exposure to chemicals that have been released into the air. Sheltering in place is most appropriate for chemical leaks of short duration (National Institute for Chemical Studies, June 2001, p.47).

The decision to shelter in place or evacuate must be made in a timely fashion to have the greatest potential effect.

Reverse 911 Notification

A number of systems have been developed in recent years that are both automated and interactive. Rather than sending out an ambiguous siren warning, these systems directly and automatically dial telephones in a specified area to relate disaster or other emergency warnings and information. It is a far cry from the vagueness of an air raid siren howling somewhere in the distance (Larson, 2000, p.76).

In a scheme commonly known as reverse 911, telephones of people in affected areas are automatically called by public safety agencies. One such system in the United Kingdom, as reported in Survive! (“Storming Success for a New Flood Alert System,” 1997) is known as “OpenTALK.” This particular system also requires the person who answers the telephone to key
on a touch pad response indicating the call was received. The list of who has and who has not
received the call is used to recall those who have not received the call. The impetus for
developing this system was a decision by the local police to no longer do door-to-door alerts
because of labor considerations. A case study of a flood warning exercise using the telephone
system was a “resounding success” (p.25).

In a special report for *9-1-1 Magazine* Larson (2000) called reverse 911 a “push”
technology because specific information is sent out to a specified area. The article quoted SCC
Communications, “More than 90 percent of all households have at least one telephone…Unlike
radio and television; a telephone is always on and is more reliable under adverse weather
conditions” (p76).

Larson’s (2000) article when speaking about Sigma Communication’s Reverse 911
system stated the system can deliver different messages to different areas in different languages,
recommending specific actions for the recipient to take. Another positive of the system according
to Ken Zweigel of Sigma Communications is, “Because many incidents are not the size or nature
that would compel a media outlet to broadcast a warning message…systems like Reverse 911
provide a community the ability to receive immediate communications about incidents that
greatly affect a neighborhood or specific geographic area” (p.77).

In addition to disasters or hazard notifications, these systems have also proven to be a
boon to law enforcement in their community policing efforts by keeping local residents abreast
of criminal activity, locating missing persons, and more (Larson, 2000, p.77). Communities
benefit from these systems by having information quickly and accurately disseminated, helping officials respond faster and smarter to such situations as inclement weather, hazmat incidents, and fires (Larson, 2000, p.77).

Larson’s (2000) article quoted Dialogic Communications Corporation’s Dave Krikac as saying “Today’s systems enable public safety agencies and 9-1-1 organizations to maximize limited resources and provide highly value-added services to their community base, with more targeted and effective distribution than previously available. Accomplishing in minutes what manual call trees and global paging systems take hours to perform, Community alerting systems automatically contact persons by phone, pager and cellular. With improved responsiveness comes increased public safety” (p.77).

Larson’s (2000) article quoted Telecordia’s Doug Allport as saying that “There are four major trends shaping community notification over the next five years. The first is the use of high-speed communications technologies such as the wireless telephone network to transmit messaging quickly and reliably. The second is the use of geographic information systems (GIS), which can target highly specific areas and regions for notification. The third trend is integration and the fourth is a move away from owning and maintaining technology”. In the same article (Larson, 2000), Jim Carroll of Qwest states “Communities across the nation are becoming more aware of how powerful advanced warning can be and the tremendous role these services play in the reduction of the loss of life and property”. While the focus has been on the utilization of this technology at the inception of an incident, there is also a growing understanding of the positive impacts these systems may have during the recovery stages of an incident when there is the
need for a timely dissemination of health and safety information to the community. Information that is vital to achieving the community’s full recovery and ultimate return to productivity.

Larson’s (2000) article states that the features and functionality of community notification systems will continue to expand allowing recipients of an emergency message to have access to specific information. Recipients will also be able to acknowledge that the message has been received and will be able to notify the emergency responder of specific response needs such as mobility or medical demands. Finally, the need for large-scale notifications to highly populated areas will drive the development of larger calling capacities. And community responder organizations will also continue to emphasize early warnings and explore complimentary technologies that further integrate with CAD and GIS technologies.

**Effective Risk Messaging and Educating the Community**

Quarantelli wrote that if, for example, “a radio station broadcasts what supposedly is an urgent message, and then reverts to normal programming, it will be far less believed than if the station converts completely and immediately to broadcasting emergency messages” (Quarantelli, 1994, p.512). Further Quarantelli wrote that messages sent by mass media are more likely to be believed if a government official is sending the message rather than a private individual. Also, the more credibility a mass media outlet has with the community, the more success they will have in delivering the warning effectively. Inconsistency also hurts believability. “A warning message, to evoke an appropriate response, must not only indicate that there is danger, but also what should be done in the situation” (p.513).
In the article *Using Automated Emergency Notification Systems to Inform the Public: A Field Experiment*, it states that tests should be conducted on the Reverse 911 notification system that include “(1) how the test call was handled when it reached the citizen’s home, (2) how receiving it affected the citizen’s awareness of and attitudes toward hazards and emergency preparedness, and (3) if the shelter in place message that accompanied the test call improved the citizen’s understanding of this self-protective technique” (Rich and Conn, 1995). The public needs to be educated that the community does have a reverse notification system and how that system is designed to notify residents in an emergency situation within their community.

The wide variety of literature on community alerting programs influenced this applied research project. It became apparent through the literature that there is strong support for the concept of reverse notification within the fire service and emergency management. A review of the research indicates that reverse notification could be a valuable community alerting and communication tool for the Minneapolis Fire Department.
PROCEDURES

Evaluative research, that included examining historical perspectives, was conducted through several avenues including literature review, personal correspondence, personal interviews, and use of a survey instrument.

Literature Review

Research questions 1, 2, 3, and 4 were answered by conducting a comprehensive literature review. Literature searches were initiated at the National Emergency Training Center's Learning Resource Center in October 2004 during the author's attendance at the NFA's Executive Analysis of Fire Service Operations in Emergency Management course. Additional searches were conducted within the private libraries of the Minnesota State Colleges and University Fire/EMS/Safety Center on multiple dates in the winter of 2004. On multiple dates in the winter of 2004, extensive searches were conducted on-line through Internet search engines to identify published documents, Web sites, organizations, and newsletters with content relative to the subjects of community alerting, reverse 911 notification, and sheltering in place and evacuation. In particular, successful strategies from other fire departments and emergency management programs as well as current trends around the nation that utilize reverse 911 notification were examined in order to develop recommendations for research question 3. Finally, the current Minneapolis Fire Department Warning and Notification Annex to the Emergency Operations Plan was reviewed and is included in this report as Appendix C.
Personal Interviews and Correspondence

Personal interviews and written correspondence were conducted with experts in various applicable fields. A personal interview was conducted with Mr. Troy Ruby of the Eagan Police Department. Mr. Ruby is responsible for the Communications Center for the Eagan Police Department. He was interviewed on April 7, 2005 using the same questions that were used for the survey instrument, which are listed in Appendix A, but with a greater emphasis placed on dialog about the answers provided in order to gain more insight about the City of Eagan’s reverse notification system.

Informal interviews were also conducted with various members of the Metropolitan Emergency Managers Association and Association of Minnesota Emergency Managers at quarterly meetings in 2004 and 2005 in an attempt to gather more information regarding the benefits others were experiencing as a result of having a reverse notification program in their respective communities. These discussions also centered the effectiveness of a reverse notification system, how the system could be used to effectively notify residents to evacuate or shelter in place, other potential uses for a reverse notification system and ways to train the community to understand the concept of reverse notification.

Mr. John DeJung is the Director for the City of Minneapolis Emergency Communications Center (MECC). Assistant Chief Ulie Seal is the Assistant Chief of Response for the Minneapolis Fire Department. Assistant Chief Seal and Mr. DeJung were interviewed at various times during the winter of 2004 to gain insight into the specific needs of Minneapolis 911 to
make reverse 911 notification an effective community alerting and communication tool for emergency responders to utilize. Once again, the basis for the interview was the questions presented in the survey instrument listed in Appendix A, but with greater emphasis placed on discussion regarding how a reverse 911 notification system could be implemented to assist the Minneapolis Fire Department in a disaster situation as well as some of the drawbacks of the technology involved to implement the system.

**Survey Instrument**

A survey instrument was developed with the assistance of fellow emergency managers to collect information from fire agencies and emergency managers across the State of Minnesota (see Appendix A). The accompanying cover letter is found in Appendix B. The survey served to collect data relative to a fire agency’s or emergency manager’s familiarity with the concept of reverse 911 notification, its potential benefits, as well as drawbacks. The survey was sent to both the Minnesota State Fire Chief’s Association membership, the Minnesota Emergency Managers Association and the Association of Emergency Managers membership via web mail lists for each organization in April 2005.

Although not a random survey of the fire service and emergency management at large, it was felt that this method of distribution might give a Minnesota perspective on the familiarity of fire departments and emergency managers in the State with the reverse 911 notification concept. The survey requested objective information from each department/emergency manager pertaining to, (a) what methods are being utilized by communities for mass notifications to
evacuate or shelter in place; (b) what information is being provided to community residents in
preparation to evacuate or shelter in place; (c) whether or not a reverse 911 notification system
would be an effective public alerting communication tool in directing residents to evacuate or
shelter in place; and (d) what type of training would need to be put in place for the community
to understand the reverse 911 notification concept. The survey was entitled Reverse 911
Notification.

Coworkers of the author in the Minneapolis Fire Department, for clarity of content and
functionality of design, first reviewed the survey instrument. It was not, however, field-tested on
sample groups. The elimination of sample testing was based on consideration of the content and
nature of the survey. The survey questions are objective rather than subjective in nature. The
survey requested factual and quantitative data rather than personal feeling or opinion. All of the
information requested in the survey could have otherwise been obtained by communication plans
of each individual fire agency or emergency management program if they utilized a reverse 911
notification system. Use of the survey instrument saved time and effort that would have been
necessary to request such documents through freedom-of-information procedures from each
individual jurisdiction.

The surveys were originally mailed on April 6, 2005. To encourage responses, each
survey was sent electronically with an option to reply electronically or by the US Postal Service.
Agencies were requested to respond immediately. A total of 12 fire departments, 4 police
departments (who had emergency management responsibilities in their jurisdictions), and 14
emergency managers responded to the survey.
The content of returned surveys was entered into a table-format database using Microsoft Excel 98. Tables were developed to compile survey information from in-state fire departments, police departments and emergency management programs (see Table 1). All tabular information was then imported into Microsoft Word 98 format for inclusion in this report.

Assumptions and Limitations

An expected limitation of the research was that some fire departments and emergency managers did not return a survey. Returned survey results were further limited by a number of other factors. The first was an assumption that individuals with sufficient knowledge of the subject to complete the survey answered all survey questions accurately. This appears to have not always been true yet most conflicting answers were not obvious enough to require follow-up telephone contact.

Another identified survey limitation was that only a small number of departments within the state returned completed copies of the survey instrument. This could have resulted from either the limit to the amount of time that the survey was out there or that some agencies were not contacted because of incorrect electronic addresses or the lack of an electronic address for their department.

A final limiting factor is the lack of information on the actual implementation and use of a reverse notification system in an actual disaster situation. In absence of such real life data,
program strengths and weaknesses can only be speculated. Because of the infancy of the use of a reverse notification system in Minnesota and across the country, there is very little data to be found on the actual objective evaluation of a reverse notification system as an effective public alerting and communication tool.

**Definitions of Selected Terms**

**Evacuation**- A directive that can be given indicating that residents need to leave their residence/business because of the potential for more harm to come to them if they stay.

**Reverse 911 Notification**- An early warning notification system capable of quickly calling multiple telephone numbers simultaneously with an urgent message. Reverse 911 is a registered trademark of Sigma Communications Inc.

**Risk Messaging**- A technique of passing on critical information to the public in a non-emergency situation so that they are more prepared in an actual emergency to do the things that emergency responders instruct them to do to protect their own personal safety.

**Shelter in Place**- A directive that can be given to residents to let them know that they need to stay indoors, shut down HVAC systems, close doors and windows and wait for the harm to pass because it is too dangerous to be outside.
RESULTS

There were a total of 30 respondents in the State that answered the survey.

In answer to the specific research questions:

1. What methods are utilized by communities for effective mass notifications to evacuate or shelter in place?

The research revealed that many communities utilize a variety of redundant ways to notify the public to evacuate or shelter in place. Results show that 53% (16 of 30) of communities primarily utilize the media (radio or television) and door to door notification (40% or 12 of 30 respondents), followed by 33% (10 of 30) a siren system, and 23% (7 of 30) the Emergency Alert System (EAS) to notify residents to evacuate or shelter in place. At this point, 33% (10 of 30) communities indicated that they are already utilizing reverse 911 notification technology to alert their residents to evacuate or shelter in place.

2. What information is provided to community residents in order to prepare for an evacuation or to shelter in place?

The research revealed that a majority of respondents felt that residents needed to know three primary things in order to prepare to evacuate or shelter in place. 80% (24 of 30) of the respondents felt that residents needed to know specific about the incident. What the hazard is, what the residents need to know about the hazard, what the responders want
them to do in response to the incident (evacuate or shelter in place) and what could happen to them if they don’t take the action that the responders are requesting of them. 60% (18 of 30) of the respondents felt the residents need to know what items to take in an evacuation like pets, medicine, clothing and money or what they need to have on hand to shelter in place. Finally, 37% (11 of 30) felt that residents need to know where to go for more information about the incident. This could be a contact number (hotline), a radio or television station to tune into for further updates and instructions, and who that point of contact would be in the incident.

3. Would a reverse 911 notification system be an effective public alerting communication tool in directing residents to evacuate or shelter in place? Why or why not?

The research revealed that overwhelmingly (90% or 27 of 30), most respondents felt that reverse 911 notification was an effective public alerting communication tool in directing residents to evacuate or shelter in place. Of those that replied yes, 4 were already utilizing the technology and 7 were in the process of purchasing the technology. Only 2 respondents felt that reverse 911 notification would not be an effective tool and 1 respondent was undecided feeling that the technology may or may not be an effective tool because of the small geographic area that needed notification in that area of the state. Those who were in favor of the tool cited many specific reasons ranging from success of actually utilizing the reverse 911 notification system to those who are in the process of purchasing such a system because they see the potential value for effective notification in an emergency situation. Those that felt that reverse 911 notification was not an effective public alerting communication tool cited that the system has some concerning limitations
such as the inability to notify unlisted numbers, the inability to tie a cellular number to an address and the potential for residents to screen the call with caller identification systems and potentially ignore the warning call. Human factors also figured into their decision such as those calls that had the potential to reach a child in the home or a member of a household that was non-English speaking. One respondent pointed out that reverse 911 notification is a good system to reach a large number of people in a short period of time. However, other systems are necessary in conjunction with reverse 911 notification to catch those residents that the system does not reach (Washington County, April 18, 2005).

4. What type of training would the community need to understand the reverse 911 notification concept?

The research revealed that most respondent believed that the training and education about reverse 911 notification needed to be community wide including private citizens and private industry as well as public responders. Even though one respondent stated that training needed to include the functions of a reverse 911 system, what it can and cant do, and the reasons that it would be utilized, there was no one jurisdiction that expressed that they had a comprehensive training program. Many respondents (67% or 20 of 30) believed that education about reverse 911 notification could be accomplished via community outlets like education fairs and presentations at city and town meetings. Some (27% or 8 of 30) thought that an initial media blitz promoting reverse 911 notification as
well as periodic reminders from the media would keep the story of reverse 911 notification alive. In addition 27% (8 of 30) believed that neighborhood meetings and newsletters would be an effective way of helping the community understand and remember the reverse 911 notification concept. As an example, residents would need to be reminded on a regular basis that they are responsible for making sure that the local responders have the most up to date contact information for their residence.

The interview with Mr. Troy Ruby, of the Eagan Police Department, revealed that their department felt that the benefits of a reverse notification system in their community would pay dividends in a large scale disaster scenario. The City of Eagan was the first community in the State of Minnesota to utilize the Emergency Preparedness Network (EPN) for mass notification. Mr. Ruby (personal communication, April 7, 2005) stated that EPN is the most efficient emergency telephone notification tool available for rapidly distributing critical information to citizens in a crisis. It combines a high capacity calling platform that can place thousands of calls in minutes, with an in-house expertise in database management. As a result, Eagan Police can deliver precise instructions (such as evacuate or shelter in place) to a specific audience more efficiently than traditional emergency notification methods such as sirens, EAS alerts or door-to-door notification. The system is capable of pulling the most up to date information from a 911 database and delivers a 30 second recorded message to 2000 numbers per minute. The Eagan Police department has only used the system once since it was implemented, but it was a huge success in finding a missing girl on January 19, 2004 (Troy Ruby, personal communication, April 7, 2005).
The Eagan Police Department has chosen to take the lead on establishing a reverse notification program in their community and has been the impetus for many other departments in the State to explore the reverse notification concept for their communities and response agencies.

The informal interviews with John DeJung (MECC) and Assistant Chief Ulie Seal of the Minneapolis Fire Department revealed that there were significant concerns about some of the potential problems encountered with the utilization of a reverse notification system. The City of Minneapolis felt that they would benefit from having a reverse notification system to notify residents in a timely manner in an emergency situation, but felt that the current drawbacks to the system were too significant to go forward with the purchase of such a system at this time. The biggest concern was in the inability of the system to make successful notifications on a number of important fronts. First, notification to the downtown business community would be significantly hampered by the fact that multiple lines to a business came in through one “PBX” line. Reverse notification relies on making notification to a specific number that is tied to a geographic location. There may be only one number for the address of a downtown business that is identified by reverse notification, yet there may be many extensions that come off the main number to that business. Reverse notification will only call the main number that is tied to an address and not notify each individual extension in the building. Unless that main number is staffed 24 hours a day and tied to a live operator that is capable of understanding the emergency message that is being relayed via reverse notification, and knows how to make fast and effective notification to the other extensions in the building, there will be many people in the downtown business district that will not receive timely information about an impending emergency.
The second concern that John DeJung and Assistant Chief Seal expressed was that even though the reverse notification technology was able to make multiple notification to cell numbers, palm pilots and pagers, those numbers may not be in the actual location of the emergency due to the transient nature of the device owners. Many residential homes no longer maintain a landline that is tied to the address of the home. In addition, mobile numbers change so frequently that ensuring that the database maintained current numbers could almost become burdensome. The onus of responsibility would need to fall back to the resident, which would then rely on the level of importance that the owner of the number gave to making sure it was current with the emergency responders. In addition, voice over internet protocol provided another challenge to making a successful reverse notification. Voice over internet protocol is a technology that allows telephone calls to be made via broadband internet instead of using a traditional landline telephone. Current reverse notification technology relies heavily on making notification to a landline telephone.

Finally, Dejung and Seal felt that unlisted numbers and caller id and call blocking may also provide a significant challenge to implementing a successful reverse notification system.

Multiple discussions held during statewide quarterly emergency management meetings in 2004 yielded similar results to the four research questions as well as raised some of the same exact concerns that John DeJung and Assistant Chief Seal voiced in regards to the technology limitations of a reverse notification system. Most emergency managers across the state were using common ways of notifying their communities to evacuate or shelter in place as indicated in the results to research question 1. Research question 2 also yielded similar answers from the
emergency managers across the state with many agreeing that incident specific information, instructions on how to evacuate or shelter in place and where the community could go for further information about the emergency were paramount. Discussion at the quarterly meetings tied to research questions 3 and 4 proved to be interesting. Discussion focused on the pros and cons of the utilization of a reverse notification system for community alerting, benefits and drawbacks to the technology, the ongoing costs to maintain updated phone numbers, human factors that the system was incapable of addressing, additional systems that could be put in place in concert with reverse notification to maximize results and community education that needed to take place for the system to be successful.

DISCUSSION

Interpretation

It was interesting to compare the survey result views of the departments that had existing reverse 911 notification systems or were exploring the option of purchasing a system with those that did not. There was very little discrepancy in the responses from those with a reverse 911 notification program and those that did not in terms of what the residents needed to know in order to evacuate or shelter in place as well as what they felt the education of the public needed to be in order to understand the reverse notification concept. Another similarity between those communities that had a reverse 911 notification program and those that did not have a system in place was the agreement that maintaining layered notification systems in place was essential in meeting all of the notification needs of the community. The redundant systems that many
communities employed for notification were virtually the same across respondents. Finally, almost all of the respondents (90%) believed that a reverse 911 notification system would be an effective public alerting tool in directing residents to evacuate or shelter in place. This may be a direct result of how far the emergency response services have come with emergency planning for community notification and the realization from previous large-scale disasters that the first response community will be overwhelmed in its ability to effective and rapidly notify the public of the need to evacuate or shelter in place in an emergency. In Minnesota, there have been very few large-scale disasters in previous years that have overwhelmed first response agencies. But the first response community is learning through training, incident reviews, and threat assessments that the potential does exist in the State for an incident that may overwhelm the first responders and require the use of reverse notification of the public it serves.

The examined literature suggested that the current systems used by the Minneapolis Fire Department for emergency notification of the public are most likely matching the base line of what is being done across the State of Minnesota. Utilizing media resources, storm sirens, the EAS system and even personnel to make emergency notification to the public seems to just simply meet the basic standard. In addition, like Minneapolis, emergency service organizations across the State, regardless of size, indicate that their resources had or would be quickly depleted and initially overwhelmed if they were impacted by a major disaster and that effectively communicating time critical information to the public in the event of an emergency would be very difficult.
A reverse notification system is one method that can be utilized to effectively communicate time critical information to the public in the event of an emergency. The system has the distinction of providing public notification of emergency warnings through the phone system within a community without the sole reliance on less effective notification methods such as television or radio, EAS, and sirens and without having to tie up emergency personnel canvassing a neighborhood making door to door notifications.

Overall, the research answered question 1 by revealing that many fire departments and emergency managers were utilizing similar methods to notify the community to evacuate or shelter in place in an emergency situation. Communities are using a variety of redundant ways to notify the public including radio and television, EAS, sirens and door to door notification. It was interesting to see that 33% of the survey respondents indicated that they have already implemented a reverse notification system in their community to augment their public alerting capabilities.

It is interesting to note that the research reveals that most of the organizations that have implemented a reverse 911 notification system in their communities are larger organizations that serve larger communities. It may then be surmised that if a reverse notification system is beneficial to a large community, it would certainly be beneficial to a small community with even more limited resources to effectively communicate time critical information in an emergency.

It is anticipated that there will be more and more emergency response services implementing a reverse notification system as part of their protocol as they begin to see the
advantages of community alerting in contrast to more traditional and even outdated methods of public alerting in an emergency situation. Qwest continues to market their community alerting system to first response agencies by saying “...that community alerting systems provide an efficient, effective method to proactively notify citizens of impending danger and give detailed instructions of required action, which can lessen potential harmful effects” (Larson, 2000, p.76).

The answers to research question 2 demonstrated that there are three primary things that each resident needed to know in order to prepare to evacuate or shelter in place. Each resident needs to know basic information about the incident such as what the hazard is, what the responders need them to do in response to the incident (evacuate or shelter in place), and what could happen to them if they didn’t take the action that the responders are asking of them. Second, each resident needed to know what items to take with them in an evacuation such as pets, medicine, clothing and money, or what they needed to have on hand in order to shelter in place such as a 72 hour kit, water and food. Finally, each resident needs to know where to go for more information about the incident.

A reverse notification system could meet all three needs in one recorded message sent out to a specific geographic area of the community that is being impacted directly by the emergency. Larson’s (2000) article remarks that a reverse 911 system can deliver different messages to different areas in different languages recommending specific actions for the resident to take. In addition, the resident will be able to acknowledge that the emergency instruction has been received and will be able to notify the emergency responder of specific response needs such as mobility or medical demands. This technology will complete the communication cycle
between the responder and the resident ensuring that the resident has not only received the emergency message but does understand the instruction given with the message such as evacuate or shelter in place. Traditional methods of notification (sirens, EAS, and media) do not complete the full communication cycle. Door to door notification may complete the communication cycle in an emergency, but is very labor intensive and not nearly as effective.

Results from research question 3 indicate that there is a lot of support for the use of reverse notification as an effective public alerting communication tool in directing residents to evacuate or shelter in place. At present, 4 of the 30 survey respondents were utilizing a reverse notification system and 7 of the 30 respondents were in the process of purchasing the technology. Only 2 respondents of 30 felt that reverse notification was not an effective tool and 1 respondent remained undecided about the effectiveness of the technology. Those that had employed reverse notification in their communities as a way of effectively notifying the residents of an emergency cited many of the desires of the technology that the literature review presented. A reverse notification system is both automated and interactive. And rather than sending out ambiguous warnings to the community, this system dials telephones in a specific area to relate disaster or other emergency warnings and information (Larson, 2000, p.76).

The interview with Mr. Troy Ruby, of the Eagan Police Department, supported the concept of reverse notification. The City of Eagan implemented the “Emergency Preparedness Network” (EPN), a reverse notification system, in December of 2003 and utilized it for a successful return of a missing girl in January of 2004. Mr. Ruby (personal communication, April
7, 2005) stated that EPN is the most efficient emergency telephone notification tool available for rapidly distributing critical information to citizens in a crisis.

The informal interviews with Mr. DeJung and Assistant Chief Seal revealed some of the significant concerns that many in emergency management and the fire service share about the utilization of a reverse notification system. Even though both supported the concept of reverse notification, each had significant concerns about some of the limitations of the technology of the system and some of limitations that human factors imposed to reverse notification. Both felt that the City of Minneapolis Fire Department could benefit from a reverse notification system if some of the issues of call blocking, voice over internet, cellular phones replacing landlines and responders could successfully impress the importance of updated information onto the public to ensure up to date contact information for the public that the system would serve.

Results from research question 4 gave the widest variety of responses in the entire survey. It was apparent from the responses that no one community had a community training program to teach the reverse notification concept to the public. Most respondents agreed that the education of the community about the reverse notification concept needed to encompass all members of the community from residents, to the private sector to the first responders. Components of the education needs to include a description of the function of a reverse notification system, what it can and cant do, and an explanation of the reasons that reverse notification would be used. Methods for accomplishing this education are as varied as there are responses. Suggestions range from presentation of the concept of reverse notification at community meetings, education fairs, city and town meetings as well as promoting the concept
of reverse notification through the media and newsletters to residents. From the research, it is
evident that the public needs to be educated that a community does have a reverse notification
system and how that system is designed to notify residents in an emergency situation within their
community.

**Implications**

Many survey respondents indicated that they are aware of the reverse notification
concept. Yet the current challenges to the technology (call blocking, cellular lines, unlisted
numbers, etc) have many emergency managers and fire departments agreeing on the theoretical
benefits of reverse notification but not implementing it in their jurisdiction until these challenges
can be addressed.

As seen with the successes of the EPN system that the Eagan Police Department
implemented and successfully used, a reverse notification system is the most efficient telephone
notification tool available to responders today. It complements traditional notification systems
like sirens, EAS, and media notification without taking on the labor and ineffectiveness of a door
to door notification.

The reverse notification concept demonstrates the perceptiveness and resiliency of the
fire service and emergency management to recognize a community need and do something about
it. The reverse notification concept develops a relationship within the community, made up of
informed citizens, with the same common interest as the fire department and emergency
management: personal and community safety. Finally, implementing a reverse notification program strengthens the value of the fire department and emergency management to the community. In an era if diminished fiscal resources and changing public expectation and perception of government, anything the fire service and emergency management can do to maximize the resources in the community is perceived to be a public good. A reverse notification program has the potential to increase the public image of the fire department and emergency management and increase their value added service to the community.

**RECOMMENDATIONS**

The Minneapolis Fire Department has always worked toward providing timely emergency notification to its citizens. Based on the results of this applied research project, it is evident that a reverse notification system could enhance the Minneapolis Fire Department’s ability to communicate time critical information to its citizens in the face of a natural or manmade disaster. The purpose of this applied research project was to evaluate reverse notification as a public alerting and communication tool and to compare it to existing communication methods currently used by the Minneapolis Fire Department to inform the public of emergency incidents that may occur in the city. The results of this research indicate that the Minneapolis Fire Department should consider the implementation of a reverse notification system to augment its ability to communicate emergency information to the community in a timely manner. Therefore based on the research conducted, the following recommendations are made:
• Continue with the current community alerting strategies that include activation of the EAS and sirens, notification to the media and even door to door notifications by the fire department until such time reverse 911 notification becomes available.

Just like many fire departments across the State of Minnesota, the Minneapolis Fire Department continues to employ sirens, EAS, media and door to door notification to notify residents in an emergency situation. Providing consistency to the public enhances their ability to understand and respond appropriately to the instruction given in an emergency situation.

• Raise public awareness about reverse notification by educating the public via local block clubs, community organizations and civilian clubs, the downtown business community as well as internally within the Minneapolis Fire Department.

Within the City of Minneapolis, there is a good base of civic, social and religious groups from which to introduce the concept of reverse notification. To raise public awareness of the program, Minneapolis Fire should consider using various media outlets including local public access channels, promotional materials that introduce the concept of reverse notification, as well as tap into the local media to raise awareness. The most successful community alerting programs use several ways to educate the public. One unique idea from the survey talked about informing residents about reverse notification by advertising in the church bulletin and on bags at the local grocery store. The education efforts need to include members of our first response community.
- Explore the implementation of a reverse 911 notification system in the City of Minneapolis once the new Computer Aided Dispatch (CAD) project is completed in 2005.

The Minneapolis Fire Department should analyze what options exist for implementation of a reverse 911 notification system for timely notification of the residents of the City of Minneapolis. It should address the shortcoming of the technology by maintaining redundant notification systems that manage to make successful notification of the public in different ways. A reverse 911 notification system will enhance the role of Emergency Management and the overall comprehensive emergency management plan for the City of Minneapolis.

By incorporating the recommendations outlined above, the Minneapolis Fire Department reverse 911 notification system will be working toward meeting the U.S. Fire Administration’s Operational Objective of promoting within communities a comprehensive, multi-hazard risk-reduction plan led by the fire service.
REFERENCES


APPENDIX A

Reverse 911 Notification Survey

1. What methods are utilized by your community for effective mass notification telling residents to evacuate or shelter in place in an emergency?

2. What information would need to be provided to community residents to help them prepare to evacuate or shelter in place?
3. Would a reverse 911 notification system be an effective public alerting tool in directing residents to evacuate or shelter in place? Why or why not?

4. What training would the community need to understand the reverse 911 notification concept?
Dear Fire Service/Emergency Management Colleague:

I am embarking upon my third Executive Fire Officer Program research paper and am in the process of collecting information from fire departments and emergency managers in Minnesota. I would appreciate it if you could take a minute to answer the following questions. I welcome any additional information that you may want to add regarding your department’s experiences with the reverse 911 notification. Please send the answers back to me by April 15, 2005 as an email attachment at the following address:

KRISTI.ROLLWAGEN@CI.MINNEAPOLIS.MN.US

Or by snail mail at

Kristi Rollwagen- Emergency Preparedness Director

Minneapolis Fire Department

350 South 5th Street- Room 230

Minneapolis, MN  55415-1387

Please call me with any questions at 612-673-2648.

Thanks for your contributions to my research efforts.
APPENDIX C

ANNEX A: WARNING AND NOTIFICATION

Purpose

To provide an overview of the responsibilities and the procedures whereby the notification of key city officials and the warning of the general public are accomplished.

Responsibilities

1. The Hennepin County Sheriff’s Radio Communications Center is the County Warning Point that is responsible for relaying warnings to the Minneapolis Emergency Communications Center (MECC), which serves as the Minneapolis Warning Point. The MECC in turn serves as the alternate warning point for Hennepin County.

2. As the city warning point, the MECC is responsible for providing warnings and notifications according to established procedures. Warnings and notifications will be accomplished by issuing appropriate two-way radio broadcasts to appropriate emergency response agencies and activation of the Emergency Warning Sequence Call List or activation of the Emergency Operations Center (EOC).

3. For notifications of persons with hearing impairments, the Interpreter Referral Center and the Minnesota Relay Service are available for notification (Title II of the ADA).

Operating Procedures

1. Warnings received from the County Warning Point:
   A. Issue appropriate two-way radio broadcasts to appropriate emergency response agencies. (See Minneapolis Police and Fire Radio Communication Capabilities).
   B. Notify appropriate key government officials. Upon request, activate the EOC. Notification of key officials will be done via telephone and/or pager using the EOC Emergency Warning Sequence Call-Out List/Checklist. (See Communications Directive).
   C. Monitor radio and television stations for delivery of appropriate public warning messages.

2. Weather warnings generated within Minneapolis for tornadic activity or sustained straight line winds in excess of 75 miles per hour, or the potential for same:
   A. Report condition to County Warning Point and request appropriate siren activation.
   B. Issue appropriate two-way radio broadcasts to appropriate emergency response agencies.
C. Notify appropriate key government officials as warranted.
D. Monitor radio and television stations for delivery of appropriate public warning messages.

3. Hazardous materials warnings generated within Minneapolis: Whenever mass evacuation is necessary for an area whose outer boundary extends at least 2500 feet from the point of the incident:
   A. Obtain a description of the area to be evacuated and, if appropriate, the proposed evacuation routes.
   B. Report conditions to the County Warning Point and request siren activation as warranted and Emergency Alert System (EAS) activation. Note: Use current EBS procedures until such time as the EAS is fully operational.
   C. **Issue appropriate two-way radio broadcasts to appropriate emergency response agencies.**
   D. Notify appropriate key government officials as warranted.
   E. Identify potentially affected private and/or public facilities and notify to the extent feasible.

4. All other emergencies:
   A. Contact appropriate government officials who will advise on actions to be taken.
   B. Succession of responsibility is MECC Director, MECC Assistant Director, Shift Supervisor on duty, and Assistant Shift Supervisor on duty.

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**Testing and Siren Malfunction Procedures**

Siren Testings: A test of the public warning system is conducted monthly at 1300 hours (1:00 p.m.) on the first Wednesday of each month. Upon request by the County Warning Point, the Minneapolis Warning Point will take the following actions:

1. Be prepared to receive and acknowledge the TEST warning and/or monitor Minneapolis siren sites to confirm siren soundings.
2. Test Minneapolis alert lists and other emergency procedures as stated in the Communications Directive.

Basic Malfunction Procedures: When a caller calls reporting that a siren is sounding:

1. Attempt to pinpoint the location.
2. Contact Hennepin County Sheriff’s Communications (HCSC) at 763-525-6216 to determine if there is an actual warning. If there is an actual warning, notify caller and suggest appropriate action.
3. If no warning is in effect, ask HCSC to send out a STOP signal. If the siren continues to sound after HCSC sends out a STOP signal, inform caller that there may be a malfunction of the system and that it will be repaired.
4. Request HCSC to notify the public of the problem via NOAA weather radio who will contact the media.
5. Siren Shut Off Procedures for Minneapolis siren locations:
• Notify the Minneapolis Director of Emergency Preparedness who will contact the appropriate company to make repairs.
• Upon reaching the malfunctioning box, the responder shall open the box to the decoder and push the “off” button, then disconnect electricity by pulling the fuse, if accessible.

Siren Locations and Coverage

<table>
<thead>
<tr>
<th>No.</th>
<th>Address</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2&lt;sup&gt;nd&lt;/sup&gt; St. No. &amp; 5&lt;sup&gt;th&lt;/sup&gt; Ave. No.</td>
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</tr>
<tr>
<td>2</td>
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<td>Pole</td>
</tr>
<tr>
<td>3</td>
<td>1800 34&lt;sup&gt;th&lt;/sup&gt; Ave. NE</td>
<td>Waite Park School</td>
</tr>
<tr>
<td>4</td>
<td>1607 51&lt;sup&gt;st&lt;/sup&gt; Ave. No.</td>
<td>Olson Junior High</td>
</tr>
<tr>
<td>5</td>
<td>E. 53&lt;sup&gt;rd&lt;/sup&gt; St. between 34&lt;sup&gt;th&lt;/sup&gt; &amp; 35&lt;sup&gt;th&lt;/sup&gt; Ave. So.</td>
<td>Pole</td>
</tr>
<tr>
<td>6</td>
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</tr>
<tr>
<td>7</td>
<td>1718 Kenwood Pkwy.</td>
<td>Kenwood Water Tower</td>
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<tr>
<td>8</td>
<td>57&lt;sup&gt;th&lt;/sup&gt; between Girard &amp; Humboldt</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>2112 Broadway NE</td>
<td>American Importing</td>
</tr>
<tr>
<td>10</td>
<td>1858 E. 27&lt;sup&gt;th&lt;/sup&gt; St.</td>
<td>Central Stores building</td>
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<td>11</td>
<td>2344 Nicollet Ave. So.</td>
<td>Hardware Mutual</td>
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<tr>
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<td>21&lt;sup&gt;st&lt;/sup&gt; Ave. So. &amp; E. 4&lt;sup&gt;th&lt;/sup&gt; St.</td>
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<tr>
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<td>Bethune School</td>
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<td></td>
<td>Street Address</td>
<td>Location</td>
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<tr>
<td>21</td>
<td>53rd St. &amp; 12th Ave. So.</td>
<td>Hale School</td>
</tr>
<tr>
<td>22</td>
<td>44th &amp; Morgan Ave. No.</td>
<td>Henry School</td>
</tr>
<tr>
<td>23</td>
<td>2914 W. 44th St.</td>
<td>Washburn/St. Thomas</td>
</tr>
<tr>
<td>24</td>
<td>2701 Johnson St. NE</td>
<td>Fire Station #15</td>
</tr>
<tr>
<td>25</td>
<td>1313 5th St. SE</td>
<td>University Tech Center</td>
</tr>
<tr>
<td>26</td>
<td>36th St. &amp; 42nd Ave. So.</td>
<td>Pole</td>
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<td>27</td>
<td>315 27th Ave. NE</td>
<td>Pole</td>
</tr>
<tr>
<td>28</td>
<td>Broadway &amp; University NE</td>
<td></td>
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<td>40th St. &amp; Bryant Ave. So.</td>
<td>Pole</td>
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<td>10th &amp; Washington Ave. So.</td>
<td></td>
</tr>
<tr>
<td>32</td>
<td>26th St. &amp; 34th Ave. So.</td>
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</tr>
</tbody>
</table>

There is 100% siren coverage for the population of the city of Minneapolis. The warning system is designed for outdoor warnings only; individuals are encouraged to purchase weather alert radios for complete indoor coverage. It is assumed that non-English speaking residents and those persons with disabilities have family members or others who will assist them in case of emergency.

For special locations such as schools, nursing homes, businesses and other places with large numbers of people, radio monitoring is encouraged. In addition, shelter plans can be drawn up to protect these populations.

**Authentication**

John Dejung  
Director, Minneapolis Emergency Communications Center
Minneapolis Communications Directive

Sirencoder Abbreviated Operator Instructions

To Activate Sirens:
1. Press one of the command keys (Attack, Alert, Test, Silent Test). The encoder will switch to siren-to-siren control mode and the key that was pressed will light. The MAIN and/or STANDBY transmitted key will flash. LCD display will prompt for more community selections.
2. Press the key or keys to select which sirens will sound. Choices are Multiple Sirens-All Call, Groups of Communities, or Individual Community. Key or keys selected will light.
3. Press both SEND keys. Audible alarm will sound and after 10-20 seconds the MAIN or STANDBY key will change from flashing to solid to indicate the radio transmitter is sending the activation signal.

How to Clear an Entry Error:
1. To clear all data entered before you press the SEND key, push the CLEAR key and all entries will be cancelled. All lights in the keys will also go out.
2. To clear a community or group entry, press the key that needs to be cancelled and it will clear.
3. Any COMMAND key pressed will cancel the previous command in favor of the new selection.

How to Cancel Entered Data and Commands
1. If send keys have not been pressed, press the CLEAR key (see above).
2. If the send keys have been pressed but the audible alarm is sounding for the 10-20 second period before activation, press the * key on the 12 button keypad below the LCD display.

How to Stop All Sirens Activated
1. Press the STOP key. The audible alarm will sound for 10-20 seconds. The MAIN or STANDBY keys will also flash. When the radio transmitter is done sending the STOP signal, the MAIN or STANDBY key will change to solid on.

Testing upon request of Hennepin County Sheriff’s Communications
1. The siren encoders are programmed to automatically test the electronics (everything except the siren) each day.
2. On the first Wednesday of each month at 1300 hours, the entire system will be tested in accordance with state policy. This is accomplished by doing the following:
   - Receive and acknowledge the test message from the State Warning Point.
   - Activate the warning system by selecting the siren test command, selecting the all-call group and activating both send buttons simultaneously.
Minneapolis Police and Fire Radio Communications Capabilities

Minneapolis has a 800 MHz Astro 25 digital trunk system with the call letters WPKH-290

Available by Dispatch Center:
- Mpls. Police dispatches precincts on talkgroups MPPD-1, MPPD-2, MPPD-3, MPPD-4
- Mpls. Police MPPD-5 car to car traffic
- Mpls. Traffic Control MPPD-6
- Mpls. Police Information talkgroup MPPD-7
- Other available Mpls. Police Talkgroups  MPPD-8, MPPD-9, MPPD-10, MPPD-11
- MPPD-12 – Mpls. Police encrypted channel available to MECC dispatch.
- Mpls. Fire main fire dispatch MPFD-1
- Mpls. Fire MPFD-3, MPFD-4, MPFD-5, MPFD-6, MPFD-7 fire tactical talkgroups
- Mpls. Fire MPFD-8 and MPFD-9 for fire investigations & training respectively or fire tactical
- Mpls. Fire truck to truck talkgroups MPFD-2, MPFD-10, MPFD-11
- MPLS-COM – Minneapolis Public Service talkaround talkgroup for any Mpls. user
- MPLS-911 – Mpls. Emergency Talkgroup available to any Mpls. user. Monitored by MECC.
- FIRESWMA-VHF (State Wide Mutual Aid Talkgroup) - used on fire mutual aid events.
- HCCOMMON - Public Service talkaround talkgroup, Available to any Hennepin County user.
- MPLS-COM – Mpls. Public Service talkaround talkgroup. Available to any Minneapolis user
- MPLS-911 – Minneapolis Emergency Talkgroup. Available to any Minneapolis user
- H-TAC3 – Regular tactical channel used by Hennepin County dispatch. Hennepin has this talkgroup hardpatched to the old VHF frequency so that 800 MHz or non-800 MHz users can communicate. Monitored by Hennepin Radio.
- H-TAC5, H-TAC6 – additional Hennepin County tactical talkgroups
- REGROUP – Used to add any talkgroup on the system to the current radio configuration on a temporary basis. Also, if a portable/mobile is lost or immediate contact with the user is needed, a supervisor can force a radio to “regroup”. This forces the radio to this channel. Anyone switching to this channel can now communicate with the radio that was regrouped.
- P-TAC1 through P-TAC4 – Talkgroups that are reserved for use as needed for interoperability communications between Metro Area 800 MHz system Public Safety users.
- METTAC-P – Hardpatched talkgroup. This 800 MHz trunked talkgroup is permanently patched to an 800 MHz conventional talkgroup, and VHF and UHF channels. The “P” indicates this channel is for use by any Public Safety User.
- SOA P1/SOA P2 – Scene of Action talkgroups for any Public Safety user on the system.
- A-TAC1 through A-TAC4 – Tactical talkgroups for any user on the 800 MHz system
• METTAC-A – Hardpatched talkgroup. This 800 MHz trunked talkgroup is permanently patched to an 800 MHz conventional talkgroup, and VHF and UHF channels. The “A” indicates this talkgroup is for use by any governmental radio user.
• SOA-1 – Scene of Action channel for any user of the 800 MHz system
• METEMERG – Metro emergency talkgroup
• MINSEF – Statewide emergency talkgroup
• MIMS - MN Incident Management System) talkgroup
• H-INTERSYSTEM – talkgroup available to any dispatch facility that has jurisdiction in Hennepin County
• MSP-2400 – MN State Patrol East metro dispatch
• MSP-2500 – MN State Patrol West metro dispatch
• H-NORTH – Hennepin County North dispatch (Rogers, Dayton, Champlain, Brooklyn Park, Hassan Township, Greenfield, Corcorcan, Maple Grove, and Osseo)
• H-EAST – Hennepin County East dispatch (New Hope, Crystal, St. Anthony, and Robbinsdale)
• MARINE 16 – Emergency marine talkgroup. Used to contact Locks or watercraft.
• STPAUL FD1, STPAUL FD2 – available for mutual aid with St. Paul fire
• MPLG-1 through MPLG-11 – talkgroups used by MPLS Public Works

NOTE:
• The Minneapolis Police Department Emergency Response Unit, Community Response Team, Organized Crime Unit, and Narcotics Unit have additional encrypted talkgroups available that are not available to MECC dispatch center.
• Mpls. Park Board uses same talkgroups as Mpls. Police.

Available from Police Mobiles and Portables:
• Mpls. Police Channels MPPD-1, MPPD-2, MPPD-3, MPPD-4, MPPD-5, MPPD-6, MPPD-7, MPPD-8, MPPD-9, MPPD-10, MPPD-11
• MPLS-911, MPLS-COM, HCCOMMON, HTAC-3, REGROUP
• PTAC-1, PTAC-2, PTAC-3, PTAC-4, METTAC-P, SOA-P1, SOA-P2, ATAC-1, ATAC-2, ATAC-3, ATAC-4, METTAC-A, SOA-1, METEMERG, MINSEF

Available from Fire Mobiles:
• MPFD-1, fire main dispatch
• MPFD-2, MPFD-10, MPFD-11 truck to truck
• MPFD-3, MPFD-4, MPFD-5, MPFD-6, MPFD-7, MPFD-8, MPFD-9 fire tactical
• MPLS-911, MPLS-COM, HCCOMMON, HTAC-3, REGROUP
• PTAC-1, PTAC-2, PTAC-3, PTAC-4, METTAC-P, SOA-P1, SOA-P2, ATAC-1, ATAC-2, ATAC-3, ATAC-4, METTAC-A, SOA-1, METEMERG, MINSEF

Available from Fire Portables:
• MPFD-1, fire main dispatch
• SOA/FIRE1, SOA/FIRE2
• MPFD-3, MPFD-4, MPFD-5, MPFD-6, MPFD-7, MPFD-8, MPFD-9 fire tactical
• MPLS-911, MPLS-COM, HCCOMMON, HTAC-3, REGROUP
• PTAC-1, PTAC-2, PTAC-3, PTAC-4, METTAC-P, SOA-P1, SOA-P2, ATAC-1, ATAC-2, ATAC-3, ATAC-4, METTAC-A, SOA-1, METEMERG, MINSEF
Hazardous Materials Response Level Descriptions

Potential Emergency Conditions

Response Level I:
An incident or threat of a release which can be controlled by the first response agencies and does not require evacuation of other than the involved structure or the immediate outdoor area. The incident is confined to a small area and does not pose an immediate threat to life or property.

Response Level II:
An incident involving a greater hazard or larger area which poses a potential threat to life or property and which may require a limited evacuation of the surrounding area.

Response Level III:
An incident involving a severe hazard or a large area which poses an extreme threat to life and property and will probably require a large scale evacuation, or an incident requiring the expertise or resources of county, state, federal or private agencies.
Hazardous Materials Notification List

For all Response Level I, II, and III incidents, the following agencies are to be contacted as needed:

- State Duty Officer   651-649-5451 or 1-800-422-0798*
- CHEMTREC 1-800-424-9300
- National Response Center 1-800-424-8802 or 202-426-2675 or 202-267-2675

*The State Duty Officer is responsible for notifying all appropriate state and federal agencies. It is essential, therefore, to keep the State Duty Officer aware of the situation should it escalate.

Level I Contacts

- Director of Emergency Preparedness
- Fire Chief
- Director of Inspections
- Chief of Police

Level II Contacts - Same as Level I with the following:

- Director of Public Works
- Mayor
- Health Commissioner

Level III Contacts - Same as Levels I and II with the following:

- Director of Communications

NOTE: Names and all contact phone numbers can be found in the supplemental document “Emergency Contact Information” which is on file in the Office of Emergency Preparedness and in the Emergency Operations Center.
Sara Title III Emergency Notification Report

Duty Officer: ________________________
Date: ______________________________
Time: ______________________________

Facilities must, per Title III, Section 304, provide ALL of the following information:

Caller’s Name ________________________ Telephone ________________________
Representing ________________________ Facility at ________________________

Contact person for additional information:

Name ________________________ Telephone ________________________

Chemical name/identity of chemical(s) involved in the release: ________________________

Is this a reportable chemical as listed in SARA, Section 302(A)? ________ (yes or no)

Incident Specs:

Quantity spilled/released into the environment: ________________________________
Time of spill/release: ________________________________
Duration of spill/release: ________________________________ (hours and/or minutes)
Released into: Air _______ Water _______ Soil _______

Any known/anticipated acute or chronic health risks associated with this release? If yes, describe: ________________________________________________________________

Any advice regarding medical attention necessary for exposed individuals? If yes, describe: ________________________________________________________________

Proper precautions to take as a result of the release, including evacuation: __________

The affected area for each precautionary action: ________________________
Other individual(s) notified, including Emergency Planning Committee(s), Emergency Coordinator(s), other states, etc.

<table>
<thead>
<tr>
<th>Names/Organization</th>
<th>Time</th>
<th>Phone Number</th>
</tr>
</thead>
<tbody>
<tr>
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</table>

Follow Up Emergency Notice:

This information must, by law, be provided by the facility, in writing, to the State Emergency Response Commission at the following address:

Director, MN Emergency Response Commission
444 Cedar Street, Suite 223
St. Paul, MN 55101-6223

A copy of this form will be provided to the Director on the first working day following a Title III release notification.
Table F1- Results from the Survey – Police/Fire/Emergency Management

Responses to Reverse 911 Notification

<table>
<thead>
<tr>
<th>Responding Department</th>
<th>What methods are utilized by your community for effective mass notification telling residents to evacuate or shelter in place?</th>
<th>What information would need to be provided to community residents to help them prepare to evacuate or shelter in place?</th>
<th>Would a reverse 911 notification system be an effective public alerting tool in directing residents to evacuate or shelter in place? Why or why not?</th>
<th>What training would the community need to understand the reverse 911 notification concept?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brooklyn Center Fire</td>
<td>A,B</td>
<td>A,C</td>
<td>Y</td>
<td>B</td>
</tr>
<tr>
<td>Carver Co EM</td>
<td>C,E</td>
<td>A,B,C</td>
<td>Y#</td>
<td>A,C</td>
</tr>
<tr>
<td>Coon Rapids Fire</td>
<td>A,B,</td>
<td>A,B</td>
<td>Y</td>
<td>C</td>
</tr>
<tr>
<td>Cottage Grove Fire</td>
<td>E</td>
<td>A</td>
<td>N*</td>
<td>A,B</td>
</tr>
<tr>
<td>Dakota Co EM</td>
<td>B</td>
<td>A,B,C</td>
<td>Y</td>
<td>C</td>
</tr>
<tr>
<td>Eagan Police</td>
<td>E</td>
<td>A</td>
<td>Y%</td>
<td>A</td>
</tr>
<tr>
<td>Eden Prairie Fire</td>
<td>A,C</td>
<td>A</td>
<td>Y#</td>
<td>C</td>
</tr>
<tr>
<td>Faribault Fire</td>
<td>A,B,D</td>
<td>A,B,C</td>
<td>Y</td>
<td>A,B,C</td>
</tr>
<tr>
<td>Forest Lake Fire</td>
<td>D</td>
<td>A,B,C</td>
<td>Y</td>
<td>A,C</td>
</tr>
<tr>
<td>Lyon Co EM</td>
<td>A,B,C,D</td>
<td>A,B</td>
<td>N</td>
<td>No response</td>
</tr>
<tr>
<td>Mille Lacs Co EM</td>
<td>A</td>
<td>A,B,C</td>
<td>Y</td>
<td>C</td>
</tr>
<tr>
<td>MSP MAC EM</td>
<td>E</td>
<td>A,C</td>
<td>Y%</td>
<td>C</td>
</tr>
<tr>
<td>Moorhead Fire</td>
<td>E</td>
<td>No response</td>
<td>Y%</td>
<td>No response</td>
</tr>
<tr>
<td>Department</td>
<td>A</td>
<td>B</td>
<td>C</td>
<td>D</td>
</tr>
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<td>-------------------------</td>
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<td>---</td>
</tr>
<tr>
<td>New Brighton Police</td>
<td></td>
<td>B,D,E</td>
<td>A,B</td>
<td>Y#</td>
</tr>
<tr>
<td>Nicollet Co EM</td>
<td></td>
<td>B,D</td>
<td>A,B</td>
<td>Y#</td>
</tr>
<tr>
<td>Ottertail Co EM</td>
<td></td>
<td>B,D</td>
<td>No response</td>
<td>Y</td>
</tr>
<tr>
<td>Owatonna Fire</td>
<td>E</td>
<td>A,B,C</td>
<td>Y#</td>
<td></td>
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<tr>
<td>Pine Co EM</td>
<td>B,C,D</td>
<td>A,B,C</td>
<td>Y/N</td>
<td></td>
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<tr>
<td>Pine Co Vets EM</td>
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<td>No response</td>
<td>Y</td>
<td>No response</td>
</tr>
<tr>
<td>Pipestone Co EM</td>
<td>B,C,D</td>
<td>A,B</td>
<td>Y</td>
<td>C</td>
</tr>
<tr>
<td>Plymouth Police</td>
<td></td>
<td>B</td>
<td>No response</td>
<td>Y</td>
</tr>
<tr>
<td>Prairie Island EM</td>
<td>A,B,C</td>
<td>A,B</td>
<td>Y</td>
<td>B,C</td>
</tr>
<tr>
<td>St. Louis Park Fire</td>
<td>B,C</td>
<td>A,B</td>
<td>Y</td>
<td>C</td>
</tr>
<tr>
<td>Stevens Co EM</td>
<td>E</td>
<td>A</td>
<td>Y#</td>
<td>B,C</td>
</tr>
<tr>
<td>Stillwater Fire</td>
<td>A,B,C,E</td>
<td>A,B,C</td>
<td>Y</td>
<td>C</td>
</tr>
<tr>
<td>Wadena Co EM</td>
<td>No response</td>
<td>No response</td>
<td>Y#</td>
<td>No response</td>
</tr>
<tr>
<td>Washington Co EM</td>
<td>B,C,E</td>
<td>A,B,C</td>
<td>Y%</td>
<td>B,C</td>
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<tr>
<td>Watowan Co EM</td>
<td>A,C</td>
<td>B</td>
<td>N</td>
<td>C</td>
</tr>
<tr>
<td>West Metro Fire</td>
<td>A,C,D</td>
<td>A,B</td>
<td>Y</td>
<td>C</td>
</tr>
<tr>
<td>Yellow Medicine Co EM</td>
<td>C</td>
<td>A</td>
<td>Y</td>
<td>B</td>
</tr>
</tbody>
</table>

**Note.** All data from 2005 survey of departments by author.

- “a” answers: A=Sirens, B=Media(Radio/TV), C=Door to Door, D=EAS, E=Reverse 911 Notification, F=other
- “b” answers: A=incident specific info, B=specific instructions (what to take, etc), C=source for more info
- “c” answers: yes or no with %=have it and # = reviewing/getting it, * has another system already in place, why/why not answers in Results section
- “d” answers: A=media, B=community education (meeting, newsletter), C=PSA/education campaign