EVACUATION AND SHELTER INSTRUCTIONS
FOR RESIDENTS OF LARGE APARTMENT BUILDINGS

EXECUTIVE DEVELOPMENT

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ABSTRACT

The problem was that during hazardous material incidents at the Wayne Township Fire Department in and around large apartment buildings not all of the occupants were being notified of the need to evacuate, or shelter in place. The purpose of this research was to develop a simple, effective Standard Operating Guideline that the hazardous materials incident command staff can use to notify the occupants of these buildings of the need to evacuate, or shelter in place. This project was conducted using action and historical research methods.

The following research questions were posed: (1) How do other fire departments notify occupants of the need to take specific actions during an emergency? (2) What methods are available to assist fire departments with getting instructions to occupants of large apartment buildings? (3) Is the portion of the population that cannot speak the English language significant enough to warrant special procedures? (4) How willing is the local media to assist in giving specific instructions to occupants of specific apartment buildings?

A survey was sent out to fifty-nine fire departments to see if they had procedures, as well as to see if they had access to the Emergency Alert System, Reverse 911, and community email systems. The local news media was interviewed to see what help they could provide. The literature at the National Fire Academy was also searched for ideas.

The results included finding that few other fire departments have procedures. Further, the broadcast media cannot be counted on to deliver the message.

The recommendations of this research included: (a) Use of the local high school FM radio station to provide full time fire department information during an emergency. (b) Implement the Reverse 911 system. (c) Alert the residents by going door-to-door.

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INTRODUCTION

After being alerted to a safety problem, people must decide what to do to protect the health and welfare of themselves and those living with them. In the case of fire and hazardous material emergencies, the decisions that people make can have grave implications. The wrong action, or inaction, can result in immediate or long-term health issues; death can be the ultimate price.

For a fire or hazardous material (hazmat) emergency at a house, the fire department can send firefighters to evacuate or give specific instructions to the occupants. Due to the limited number of firefighters available, doing this for large apartment buildings is not always feasible.

The Wayne Township Fire Department (WTFD) does not have a Standard Operating Guideline (SOG) indicating how this is done. The problem is that during hazardous material incidents in and around large apartment buildings, not all of the occupants are notified of the need to evacuate, or shelter in place. This has happened on at least one run with which the author was involved.

Since there is no SOG the decision is left to the incident commander who must make a decision in the heat of the moment. With 11,727 apartment units in 916 buildings situated in 39 different apartment complexes (R. Gulley, personal communications, October 28, 2002) it is inevitable that there will be another hazmat emergency at a large apartment building in the future.

The purpose of this research paper is to propose a safe, simple, effective procedure the hazardous material incident command staff can use to notify occupants of large apartment buildings of the need to evacuate, or shelter in place.

Historical and action research methods were used to answer the following questions:

1.   How do other fire departments notify occupants of the need to take specific actions during an emergency?

2.   What methods are available to assist fire departments with getting instructions to occupants of large apartment buildings?

3.   Is the portion of the population that cannot speak the English language significant enough to warrant special procedures?

4.   How willing is the local media to assist in giving specific instructions to occupants of specific apartment buildings?

BACKGROUND AND SIGNIFICANCE

The Wayne Township Fire Department of Marion County, Indiana, provides fire, emergency medical, rescue, and hazardous materials services to the suburban west side of Indianapolis. After the events of September 11, 2001, the department had a significant increase in the number of calls for suspicious substances found in offices, residences, public places, apartment buildings, and the mail. For 2001, there was one such call before September 11. After that date there were 43 (Garino, 2002).

In 2002, one such call escalated into a hazmat incident that resulted in the evacuation of an apartment building with 48 units. The evacuation did not go well. Originally, the incident commander's plan was to shelter the residents in place since the amount of the chemical that was spilled in the common stairwell was small. However, there was no procedure in place to convey this message to the residents.

Some residents looked out the window and saw the fire department at their building and self evacuated. Others self evacuated in the course of their normal comings and goings. The people who self evacuated put themselves in potential danger because they walked in the common hallway without any respiratory protection. Fortunately, for all involved, the chemical turned out to be benign.

Later, at a meeting of the hazmat local area planning committee, an issue was raised about how to inform citizens of the need to evacuate, shelter in place, or take other specific actions in the case of emergency. Although the meeting was attended by many of the leaders of the fire departments in Marion County, no consensus was reached.

Use of firefighters going door-to-door is labor intensive and can take a long time. Use of building fire alarms may alert residents to a problem, but not give them specific instructions.

Use of the broadcast media such as radio, television, and cable may not be possible. Indianapolis is the 29th largest metropolitan statistical area (MSA) as defined by the 2000 census (US Census Bureau, 2001). The area has over 1.6 million people (US Census Bureau, 2001). The broadcast media may not be willing to provide the continuous, exclusive coverage to an event that may affect less than 100 people.

The hazmat command staff needs a simple, effective way to give instructions to people. When people know what to do in an emergency, they are better able to reduce the impact on their life, health, and economic condition. This coincides with one of the United States Fire Administration operational objectives, "To promote within communities a comprehensive, multi-hazard risk-reduction plan led by the fire service organization" (National Fire Academy [NFA], 2002, p. II-2).

Being able to give specific instructions to people who need them, something the Wayne Township Fire Department cannot easily do now, would increase the quality of the service to the citizens. This directly relates to the Service Quality/Marketing unit of the National Fire Academy's *Executive Development* course. This unit discusses the need to focus on the customer,

(NFA, 2001, chap. 10, p. 3), as well as using information technology to improve services to the citizens (chap. 10, p. 20).

LITERATURE REVIEW

Introduction

For the literature review, the author visited the National Fire Academy's Learning Research Center (LRC). The on-line card catalog was searched for information on evacuation, alarms, emergency alert systems, emergency communications, reverse 911, and other related topics. As part of a survey, departments were asked to return portions of any SOGs or Standard Operating Procedures (SOPs) having to do with providing instructions to occupants of large apartment buildings. Interviews were conducted as well, both in person and by telephone.

This literature review will discuss alerting the citizen, citizen reaction to alerts, shaping the citizen response, and following up.

Alerting the Citizen

Mileti and Sorensen (1990, chap. 3, p. 13) wrote that personal contact with people has the advantage that people are more willing to respond to a warning delivered personally. This is because they are more likely to believe that a danger exists. Reinforcing this idea, Quarantelli wrote, "Warnings delivered directly by other people are more likely to be believed than when communicated by an impersonal medium" (Quarantelli, 1984, p. 512). The disadvantage as Mileti and Sorensen point out is that this method is time consuming and labor intensive (chap. 3, p. 13).

While many apartment buildings have traditional (bells or horns) fire alarm sounders, Jones (1990), in his article on voice warning methods, stated, "It is well known that most people don't pay attention to bells or sounders because they don't know what to do when they hear them" (p. 18). In fact, bells and sounders may confuse people because of the various patterns with which they can be programmed. Further, other activities people are engaged in may diminish the impact of a bell or sounder. In an early paper on high-rise firefighting, Glass and Rubin (1976) stated, "A warning signal must have sufficient impact to come to the attention of people despite their attention being focused elsewhere" (p. 3).

Lessons learned in high-rise situations are applicable here. In the introduction to the chapter on high-rise construction in *Building Construction for the Fire Service* Brannigan (1999, p. 452) wrote that buildings of any height can have the same problems as high-rises.

To study a Canadian high-rise fire that occurred in January of 1995, Dr. Proulx (1996) mailed questionnaires to the occupants of the building involved. (Questionnaires were not mailed to survivors living in the apartments which had fatalities.) The resulting study reported that senior citizens were significantly less likely to hear the building fire alarm. Age is only one

factor. Those living in the corner apartments of this particular building were also significantly less likely to hear the alarm bells in the halls due both to the distance from the apartment to the bells and well as sound attenuation.

Studying two fires in high-rise buildings in Hong Kong, only 11 percent of the people who answered the question "How did you realize there was a fire?" answered that it was the alarm bell (Lo, Lam, Yuen, Fang, 2000, p. 145).

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 goes on to report 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 to a broadcast or cable station can be converted, presumable by a computerized text reader, into any language.

Still there are problems using radio to alert people. On 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 the late night hours. Television suffers from the same disadvantage (Mileti & Sorensen, 1990, chap. 3, p. 14).

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 New Flood Alert System," 1997) is known as "OpenTALK." This particular system also requires the person who answers the telephone to key in a touch pad response indicating the call was received. The list of who has and 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 to a specified area. The article quoted SCC Communications, "More than 90 percent of all households have a least one telephone.…Unlike radio and television, a telephone is always on and is more reliable under adverse weather conditions" (p. 76).

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 recipients 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).

A discussion was held with Jill Rott (personal communications, January 13, 2003) of Reverse 911, a division of Sigma Communications. Sigma is the company that makes equipment to be installed at a customer's premises that makes automated telephone calls. The registered name of their system is Reverse 911. Rott was chosen because her company had installed systems in two communities close to WTFD, Beech Grove, and Carmel, Indiana. In discussion, she stated the Reverse 911 system could make about 1,000 calls per hour with eight outgoing telephone lines. The telephone numbers in the database would come from the county's 911 system, which includes unpublished numbers. People with cell phones and pagers could have their numbers added. Messages could be pre-recorded or recorded as needed. The calls could go out to a pre-defined area or the area could be chosen from a map at the time of need.

A discussion with Donald Kinstler of Reilly Industries (personal communications, January 8, 2003) was held to talk about the CAN system. Mr. Kinstler is the safety manager for Reilly Industries. Reilly Industries is a chemical manufacturer in WTFDs area. It is known in the area that Reilly has a telephone call system set up to make notifications to area residents in case of a chemical emergency at their plant. This system is known by the acronym CAN. This is for Community Alert Network, the company that runs the system. Kinstler explained there are 4,100 telephones in the database. Unlisted numbers are not included in the database unless they are added by manually. The telephone numbers are divided into four zones, an area north, south, east, and west of the plant. Three messages can be sent out. One is a test message. The second is a shelter in place message. Lastly, there is an all clear message. When there is an emergency, on site personnel call a toll free number. They instruct the system which zone to call and with which message. The system is located off site, with two redundant locations. The system can call about 400 calls per minute.

Citizen Reaction to Alerts

Choppen, writing in *Fire Safety Engineering* about people's reaction to fire alarms stated, "the fact less than 15 percent of the population will react appropriately to fire alarm sounders has been understood for more than 30 years" (2001, p. 18). Making a case for voice fire alarms in buildings that Choppen said have been shown to be 70 percent effective, he stated, "The lack of appropriate response must, in part, result from the difficulty in identifying an alarm signal" (p. 18). Further, fire alarm sounders are not, "easily differentiated from all of the other aural alarms that clutter contemporary society. In practice an alarm signal will trigger the correct response only if its meaning is clear and unambiguous" (p. 18).

"The public simply does not panic in response to warning of impending disasters…panic does not follow a warning except in very rare circumstances" (Mileti & Sorensen, 1990, chap. 3, p. 2). Quarantelli (1984) wrote that panic is rare even when people are afraid. In fact, "it would

be very difficult for a warning message to evoke panic flight" (Quarantelli, 1984, p. 513). In evaluating prior research on panic in fire situations, Lo, Lam, Yuen, and Fang have found, "panic is not the usual response especially at the initial stage when the occupants have just acquired the cue" (2000, p. 143).

If people do not panic, just what do they do when alerted to an emergency? Lo, et al. (2000) described a four-step process. The first is notice the cue. In case of fires, cues include the fire alarm, abnormal noise, and a burning smell. The second is to validate the cue. People tend to do this based on past experience and in the form of an optimistic expectance. Thirdly, people will try to determine the seriousness of the situation. Lo, et al. noted here that this third step could be skipped if the initial cue was being told by other people. Lastly, people will define the nature and effect of the threat (pp. 146-148).

Quarantelli (1984) in his article "Perceptions and Reactions to Emergency Warnings of Sudden Hazards" stated that, "in situations where it is possible people will check for environmental cues i.e. rising waters, signs of fires, darkening skies, smoke clouds, and so forth" (p. 512). Quarantelli also wrote about the warning confirmation. People almost inevitably seek out further information to validate the original message. If the warning is something the person has prior experience with it will tend to make the warning more credible. "Perceived proximity, severity, and certainty of immediate personal danger are also very important to the warning belief" (p. 512).

The case study by Proulx (1996) of the Canadian apartment building fire reported, "Most occupant's initial response was to investigate, i.e. check the corridor, feel the door or look out the window or seek information, i.e. call a neighbor or the building management" (p. 25). The study went on to say, "Occupants who had received fire safety information were more likely to investigate, whereas those who had not tended to seek information and wait"(p. 25).

Mileti and Sorensen (1990, chap. 5) wrote about six items in the response process for people given a warning. The first is hearing the warning itself. They caution that just because a warning is broadcast or a siren sounded, people may not hear it.

The second step in the process is understanding the warning that "does not refer to correct interpretation of what is heard, but rather to the personal attachment of meaning to the message" (Mileti & Sorensen, 1990, chap. 5, p. 2). For instance, people may have a different interpretation as to what constitutes a flood.

The third step in the process is believing. The "cry wolf" syndrome is mentioned here, although this is not always a factor for a warning in general (Mileti & Sorensen, 1990, chap. 5).

The fourth step is personalizing. People have to feel they are targets of the warning. They must feel what is being warned about can happen to them (Mileti & Sorensen, 1990, chap. 5).

The fifth step is deciding and responding. Here the person decides "what if anything to do about the risk" (Mileti & Sorensen, 1990, chap. 5, p. 2). People will do what they think is best, which may not be what an expert thinks is best.

The last step Mileti and Sorensen spoke about is the confirming step. "Most people actively seek out additional information" (Mileti & Sorensen, 1990, chap. 5, p. 3). "The confirmation process occurs because people are information hungry following receipt of warnings. Rarely are people overwhelmed by information in a warning context" (Mileti & Sorensen, 1990, chap. 5. p. 3).

Shaping the Citizen Response

In the case study on the Canadian apartment fire, "Ninety-six people (46 percent the respondents) watched the television or listened to the radio to glean news of the situation" (Proulx, 1996, p. 26) which was the fire in their building. "They found this frustrating and frightening as the news reported that there was a fire, which they already knew, and that people had died without giving any advice to people still left in the building" (Proulx, 1996, p. 26).

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 there is danger, but also what should be done in the situation" (p. 513).

In a paper for the National Fire Academy's Executive Fire Officer Program, Joseph Tanner (1990, p. 4) described the use of a local radio station as part of a public education and information blitz after the devastating effects of hurricane Hugo in 1989. Leaflets were handed out door-to-door. Hourly updates were given on the radio station. Tanner wrote, "The Blitz approach, I feel, is responsible for the absence of injuries and only a single loss of life from fire during the recovery process" (p. 13). Further, a recommendation of this paper was "A telephone answering and information distribution network should be established utilizing available communications systems" (p. 16). A follow up telephone call to Tanner (personal communications, January 20, 2003) indicates his town has now installed their own FM radio station to broadcast emergency information.

Discussions were held with personnel of three local television stations, one local commercial radio station, and one local non-commercial high school radio station. These stations were chosen because of their prominence in the WTFD response area.

Jon Easter, station manager of WBDG, (personal communications, January 9, 2003) the non-commercial high school station, indicated his station would give continuous live coverage to an emergency event unless it interrupted a sporting event. The size of the event did not matter, if the fire department wanted help his station would help. He did state, however, that a community service program such as this would have to be approved by his superiors.

Steve Simpson senior producer of news and programming for WIBC radio (personal communications, January 17, 2003) indicated that his station would interrupt programming if an incident affected a neighborhood or a couple of streets. Continuous coverage would only be for large incidents.

Commercial television station newsrooms were contacted for a discussion on interrupting programming. When questioned on how big an incident would have to be to interrupt programming, answers were vague with such factors mentioned as immediate threat to life, (Brady Gibson, personal communications, January 17, 2003) evacuation of a square mile or neighborhood (Jim Scott, personal communications, January 20, 2003), and how toxic the incident is (Kyle Thomas, personal communications, January 20, 2003).

In *Operational Considerations For Highrise Firefighting* Bush and Routley wrote that a building public address system "is an important tool for evacuation management" (Bush & Routley, 1996, p. 39). If a building does not have a public address system, then the "fire department personnel will have a difficult time managing the evacuation of a highrise (*sic*) building" (p. 39).

Referring to the fire alarm system, Glass and Rubin (1976) wrote in *Emergency Communications in High-Rise Buildings* that the appropriateness of the building occupants "can be attributed to the effectiveness of the messages transmitted by the system and the previous training of the occupants" (p. 5).

An *NFPA Journal* (Moore, 2001) which spoke about the need to protect public address wiring in high-rise buildings said, "Records of high-rise fires indicate that voice communications not only instruct occupants to stay in place or relocate, but they also reduce panic" (p. 50).

Following Up

Some of the research done by different authors is the result of analysis of past incidents. Mileti and Sorensen (1990, chap. 2, p. 12) reported on the research of at least six hazardous material incidents. "A Pre-Evacuation Behavioral Study for the People in High-Rise Residential Buildings under Fire Situations" (Lo, et al., 2000) was based on interviews after two fire incidents. Much of the data in "Critical Factors in High-Rise Evacuations" (Proulx, 1996) was gathered by survey after a fire in Canada.

Summary

The result of the research at the LRC indicated that the issue is more complex than just expecting people to do what you want them to do. Neither is it as simple as knocking on a door and telling people to get out.

The interviews with the members of the mass media showed that you just cannot call the local station and get them to do exactly what you want either. Still, the mass media may be helpful in disseminating information once people are alerted.

PROCEDURES

Definition of Terms

Ability to speak English "For a [census] respondent who speaks a language other than English at home, refers to his/her assessment of his ability to speak English, from 'very well' to 'not at all'"(US Census Bureau, n.d.).

Census tracts "A small, relatively permanent statistical subdivision of a county delineated by a local committee of census data users for the purpose of presenting data" (US Census Bureau, n.d.).

Language spoken at home "The language currently used by the [census] respondents at home, either 'English only' or a non-English language which is used in addition to English or in place of English" (US Census Bureau, n.d.).

Metropolitan Statistical Area "A geographic entity defined by the federal Office of Management and Budget for use by federal statistical agencies, based on the concept of a core area with a large population nucleus, plus adjacent communities having a high degree of economic and social integration with that core" (US Census Bureau, n.d.).

Reverse 911 Name of an automated system that can quickly call multiple telephones simultaneously with urgent messages. Reverse 911 is a registered trademark of Sigma Communications Inc.

Question Specific Procedures

Research Question 1. A survey was sent out to 59 fire departments in the United States and Puerto Rico. A copy of the survey is in Appendix A, the cover letter in Appendix B. A list of the departments the survey was sent to is in Appendix C.

The Wayne Township Fire Department is in the Indianapolis Metropolitan Statistical Area (MSA). The Indianapolis MSA is the 29th largest as defined by the United States Census Bureau based on the 2000 census (US Census Bureau, 2001). A random fire department was chosen from each of the 28 MSAs larger than Indianapolis, the 28 smaller than Indianapolis, and one from Indianapolis. Forty-one surveys were returned. A list of the top 60 MSAs is in Appendix D.

Research Question 2. A literature search was done at the National Fire Academy Learning Resource Center during a visit for that purpose in October 2002.

Respondents to the survey used in research question one were asked to send a copy of any applicable procedures.

An discussion was conducted with a sales manager for a product (Reverse 911) which can make mass telephone callings. This product was chosen because it has been installed in at least two communities in the Indianapolis MSA. This sales manager was asked to describe her product, including price, speed, and how the system works.

A discussion was conducted with a user of a service (Community Alert Network) which will make mass telephone callings. This user is in the WTFD response area. The user was asked to describe the service and his company's experience with the service.

The Internet was used to access the results of the 2000 United States census. First, a map showing the census tracts in the WTFD response area was printed out. Because two of the census tracts did not correspond with the WTFD boundaries, an estimate was made as to the percentage of area in WTFDs response area (Appendix E). All data for these two census tracts was scaled by this amount. Data on the number of occupied housing units in WTFDs response area was accessed. Data on the number of occupied housing units without telephone service was accessed. The percentage of occupied housing units without telephone service was then derived (Appendix F).

Research Question 3. The Internet was used to access the results of the 2000 United States census. Data on the number of people over five years of age was accessed. Data on the number of people over five years of age who did not speak English well or very well was accessed. The percentage of people who do not speak English well or very well was then derived.

Two survey questions, questions four and five, were asked on the survey used in research question one. The complete survey is in Appendix A. These questions were chosen to determine if other fire departments felt the need to have provisions for communicating with people who cannot read or speak English.

Research Question 4. A personal interview was held with the station manager of the local non-commercial high school FM radio station. The following questions were asked: 1) How big, in terms of number of people affected, would a hazardous materials incident or fire have to be before you would interrupt programming to broadcast live evacuation or shelter in place instructions? 2) Would you be willing to provide constant information about the incident until the danger is over? 3) What kind of exceptions to the previous questions can you envision? 4) Is it okay to use your response, station name, and your name in this research paper?

Telephone interviews were conducted by calling the newsroom telephone line of three local television stations, and one local commercial radio station. The newsroom telephone line was chosen because this would be the line the WTFD would call at this writing for media assistance. It was felt the person answering this line would give honest answers about what the station would do to comply with any fire department requests. The following questions were asked: 1) How big, in terms of number of people affected, would a hazardous materials incident

or fire have to be before you would interrupt programming to broadcast live evacuation or shelter in place instructions? 2) Would you be willing to provide constant information about the incident until the danger is over? 3) What kind of exceptions to the previous questions can you envision? 4) Is it okay to use your response, station name, and your name in this research paper?

Limitations

The surveys for research question one were sent to the chief of the surveyed fire department. Because they are anonymous, there is no way to be sure the person filling out the survey was the chief, or even anyone who could answer the questions with certainty. It is probably fair to say, however, that overall the answers are an accurate representation of fire departments in communities the size of the WTFD. In addition, while the United States Fire Administration is working on a complete list of fire departments, there is not one currently available. The addresses of fire departments surveyed were obtained from the Internet. Therefore, survey results may be skewed towards departments with a Web presence.

The people interviewed may have misstated the policy of the respective organizations or may have misstated the capabilities of a particular product.

The census data used was based on where people live, not where people work. Some census questions are not asked of everyone, only a sample of the population is questioned.

RESULTS

Research Question 1. Of the 41 fire departments that answered the survey, 84.6 percent (33 of 39) indicated that they had no procedure for giving specific instructions to occupants of large residential structures in case of hazmat incident or fire when there is no internal public address system in place. Only 15.4 percent (6 of 39) said they did. Two did not answer the question (survey question two). Respondents who indicated they did have a procedure in place (6 of 39) were asked to provide an SOP. **No** SOPs were received, although four simply wrote on the survey form. One wrote that they had enough firefighters to do door-to-door notifications. One wrote they used a Reverse 911 system. One wrote they used an "informal P. A. system" (anonymous survey result). The fourth respondent said they notified the sheriff with no further specifics.

However, 39.0 percent (16 of 41) answered (survey question three) that they had formal arrangements with local broadcast media outlets to relay information to occupants of large residential structures in case of hazmat incident or fire. Sixty-one percent (25 of 41) said they did not.

Survey questions 6A, 6B, and 6C related to an automated system where a telephone call can be made to many specific telephones at once, commonly referred to by the trademark Reverse 911. Forty-five percent (18 of 40 with 1 not answering) of the respondents said they had

access to such a system. Fifty percent (9 of 18) of those with access to such a system had used it, but only 29.4 percent (5 of 17 with 1 not answering) had an SOG covering its use.

A community email alert system (survey questions 7A, 7B and 7C) is available for 9.8 percent (4 of 41) of the survey respondents. Twenty-five percent (one of four) had used the system, 25 percent (one of four) had an SOG covering its use.

As for the Emergency Alert System, (survey questions 8A, 8B, and 8C) 73.2 percent (30 of 41) of the respondents said they had access to such a system. Of these 30, 40.7 percent (11 of 27 with 3 not answering) had used the system, but only 25.9 percent (7 of 27 with 3 not answering) had an SOG covering its use.

Complete survey results can be found in Appendix G.

Research Question 2. The literature review uncovered a variety of ways to assist fire departments in alerting citizens and giving them specific instructions. As far as mass notifications, several articles mention fire bells and horns (Proulx, 1996; Lo, et al., 2000, p. 145). Public address systems, sirens, and air horns are mentioned in the Phoenix Fire Department SOP (1996). Radio, television, and cable being used with the Emergency Alert System are written about by LeBow (1996) and in the *Journal of Civil Defense* ("The Emergency," 2000). Bush and Routley (1996, p. 39) among others, mention in building public address systems.

In person is another way (Mileti & Sorensen, 1990, chap. 3 p. 13; Quarantelli, 1984, p. 512). A citizen can also be notified individually by telephone by schemes that do mass telephone calling such as Reverse 911 (Larson, 2000; "Storming," 1997).

Jill Rott (personal communications, January 13, 2003) of Reverse 911 indicated that her company's mass telephone calling system is installed at the customer's site. The mass telephone calling system used by Donald Kinstler of Reilly Industries (personal communications, January 8, 2003) is accessed locally, but the actual system is off site.

Based on the census data, which is listed by census tract in Appendix F, there are 29,946 occupied housing units in WTFDs area. Of that number only 490 (1.64 percent) do not have telephone service.

Research Question 3. Based on the census data, which is listed by census tract in Appendix H, there are 65,567 people over the age of five who live in the WTFD response area. Of that number 854 (1.30 percent) do not speak English well or do not speak English very well.

Results of survey question four indicates that 61 percent (25 of 41) said their department felt that there is a need, in case of hazmat incident or fire, to have special provisions for people who cannot speak or read the English language. Slightly more than 54 percent (13 of 24 with 1 not answering) of the departments who felt there is this need have provisions for people who cannot speak or read English (survey question five). Complete survey results can be found in Appendix G.

Research Question 4. When asked how big, in terms of number of people affected, would a hazardous materials incident or fire have to be before programming was interrupted, Jon Easter of WBDG (personal communications, January 9, 2003) indicated that his station would be willing to interrupt programming any time the fire department requested if such a policy was approved by his superiors. Easter indicated that he was in favor of such a policy as it supported the community service side of broadcasting he teaches to his students. Easter stated that his station would also be willing to provide constant communications until the danger was over. The exceptions would be that he would not want to interrupt the broadcasting of a sporting event. Further, the station is automated and unattended at times. Equipment would have to be purchased to allow interruption by remote control. Permission was granted to use the interview in this paper.

Steve Simpson of WIBC radio (personal communications, January 17, 2003) stated that an incident would have to be "large" with no number figure put on it. Continuous coverage would depend on size of the affected area. He knew of no exceptions. Permission was granted to use the interview in this paper.

Brady Gibson of WRTV (personal communication, January 17, 2003) television stated that to interrupt programming a situation would have to involve immediate threat to life, such as a tornado. Continuous coverage of a story would depend on severity and damage. The exception question was not directly answered. Permission was granted to use the interview in this paper.

Jim Scott of WISH television (personal communications, January 20, 2003) would not give a number figure on the number of people involved before programming was interrupted. He did say that a square mile or neighborhood would be a good estimate. Providing continuous coverage would depend on the compelling interest, as well as time of day. There were no firm exceptions. However, the decision to interrupt in the first place is based on judgment. Permission was granted to use the interview in this paper.

Kyle Thomas of WTHR (personal communications, January 20, 2003) television said interruption of programming would depend on the type of incident. For instance, he would want to know how toxic a release is. Other factors in deciding to interrupt programming include what program is being interrupted. He indicated staying with the story would also be made on a case-by-case basis. The programming being interrupted would be a factor in this decision as well. The exception question was not directly answered. Permission was granted to use the interview in this paper.

SOP recommendation. The recommendation for a Standard Operating Procedure is included as Appendix I.

Unexpected Result. Only 15.4 percent answered yes to survey question two indicating their department had a procedure for giving specific instructions to occupants of a large residential structure in case of hazmat incident or fire. Yet 39.0 percent answered yes to survey question three indicating they had a formal arrangement with local broadcasters for the same reason. Either the respondents misread or misunderstood the survey questions two and three.

DISCUSSION

Giving specific instructions to an unknown number of people in 50 apartments in a building is not an easy task if the building does not have a built in public address system.

Survey question two seems to indicate that few other fire departments have the answer. A low 15 percent said that they had specific procedures in place. Of the six who said they had a procedure, four offered specifics: door-to-door, Reverse 911 system, an "informal P. A. system" (anonymous survey result), and notifying the sheriff.

After reading the literature and the survey results, it is felt that to notify occupants of large apartment buildings of the need to evacuate or shelter in place there are two elements. The first element is to get the residents to realize that there is an emergency. The second element is to get them to do what you want. These two elements should encompass the four step process of Lo, et al. (2000, pp. 146-148) and six steps of Mileti and Sorensen (1990, chap. 5).

To make occupants realize there is an emergency, one option is to set off the building fire alarm, but only if you want the building evacuated. This, however, must be followed up as the literature shows ringing the fire alarms to be very ineffective. Jones (1990 p. 18) points out most people do not pay attention to bells or sounders because they do not know what to do when they hear them. Even hearing them is a problem. Proulx's (1996) study of a Canadian high-rise fire found senior citizens were less likely to hear alarm bells. Only 11 percent of those answering a survey on how they were alerted to fire in two separate incidents in Hong Kong said it was the alarm bell (Lo et al., 2000, p. 145). Choppen (2001, p. 18) writes that it is well known that less than 15 percent of the population will react properly when they hear fire alarms.

Door-to-door is a labor-intensive option. However, Mileti and Sorensen (1990, chap. 3, p. 13) and Quarantelli (1984, p. 512) agreed that door-to-door is a good way to communicate a warning because those being warned are more likely to believe the warning when it is delivered in person.

Perhaps this is why the Phoenix (1996) fire department SOP has their firefighters, when going door-to-door, wear all the protective gear, including their self-contained breathing apparatus (SBCA) albeit not breathing air. The SCBA would help make people believe that the something bad may happen if they do not follow instructions.

Another option is to call on the telephone. Forty-five percent of the departments answering the survey said they had access to a Reverse 911 system. US Census Bureau (2003b) data summarized in Appendix F shows that over 98 percent of the occupied housing units in the WTFD area have telephone service. The *Survive!* ("Storming," 1997) article on a warning in the United Kingdom given by a Reverse 911 type system was a success.

Messages from Reverse 911 can be issued in several languages. The area targeted for the messages can be specific, being determined with a computer and a map (Jill Rott, personal communications, January 13, 2003). Only 1.64 percent of the housing units in WTFDs area do not have telephone service. It is felt that installing and using a Reverse 911 system should be in

the WTFDs long-term plans. The system could call all the telephones in an apartment building with specific instructions. This would satisfy the two elements, notifying residents and giving them instruction to do what is wanted. Door-to-door notifications would only have to be made to those who did not acknowledge the message through touch pad response.

Using the mass media is an option. However, interviews with representatives of the four commercial broadcast outlets, one radio, and three television indicated that the media cannot be counted on with 100 percent certainty, especially for small incidents. The survey instrument indicates that use of the media, albeit for unknown size incidents, is something other departments count on. Seventy-three percent had access to the Emergency Alert System.

Even if the media was 100 percent cooperative, there are still problems using them. Obviously, as Mileti and Sorensen (1990, chap. 3, p. 14) remind us, the receiving device (your television or radio) must be turned on. Further, they also point out that the warning goes to areas not at risk. This is especially true in large metropolitan areas such as Indianapolis.

The local high school FM station, WBDG, indicated (J. Easter, personal communications, January 9, 2003) they would be almost 100 percent cooperative with the fire department assuming they got approval from their governing body. Another advantage of using this station is that it is lower power with a lower antenna. While it covers the WTFD response area, warnings will not go into as large an area not at risk.

WBDG's willingness to provide continuous coverage is an important factor as well. Quarantelli (1994, p. 512) indicated it helps in message believability if the broadcast station does not return to regular programming. Proulx's study (1996, p. 26) showed that people whose building was on fire were frustrated because they were not being told what do. Other fire departments have installed their own stations for this purpose (J. Tanner, personal communications, January 20, 2003). Fox (1995) wrote an Executive Fire Officer Applied Research Project on the subject.

In essence, having a small local radio station under the control of the fire department is almost equivalent to putting a temporary building public address system in place. Such systems have been shown to be very helpful. Bush and Routley (1996, p. 39) told us public address systems are important for evacuation management. The *NFPA Journal* (Moore, 2001, p. 50) indicated that voice communications helped instruct occupants. Further, even if residents are evacuated, instructions can be delivered to them anywhere there is an FM radio, including their automobiles. This helps with the second element, getting the residents to do what is wanted.

In what other language besides English should the instructions be given? While the census data for the WTFD response area indicates the number of people who cannot speak English is less than two percent, survey results indicate a majority (61 percent) of the fire departments feel there is a need to have special provisions for people who cannot speak or read the English language.

RECOMMENDATIONS

The first recommendation is included in Appendix I, an SOG proposal for giving shelter in place instructions to residents in large apartment buildings. Although door-to-door takes the most manpower, given the current resources, it is the best option for alerting residents of the need to shelter in place. However, to speed the process, preprinted shelter in place instructions should be handed out. These instructions help fill the need for people to have more information.

Cards should be written in English and Spanish. The census data for WTFDs area (Appendix H) indicated that for those who do not speak English in their home, Spanish is spoken almost as much as all other languages combined. In fact, one of the local Indianapolis television stations, WISH, is going to launch a Spanish station in February of 2003 (Allan, 2003). The article on this station in *The Indianapolis Star* stated that according to the 2000 United States Census, Marion County, (the county where WTFD is located) has seen an increase in the Hispanic population of 294 percent from the 1990 census to the 2000 census (as cited in Allan, 2003, p. A1).

Within one year, it is recommended that WTFD have access to WBDG radio and this information be placed on the preprinted instruction cards. This essentially gets a temporary public address system installed within the building. This will allow the residents to gather more information about the incident. The information will be continuous, current and in Spanish and English. This should result in better compliance with the instructions.

Within three years, WTFD should have a Reverse 911 system. This will further speed up the notification process and should diminish the manpower needed to go door-to-door. Only residents that do not acknowledge the Reverse 911 will have to be contacted by going door-to-door. An integral part of the Reverse 911 message will be tuning an FM radio to WBDG for further information.

The evacuation SOG is very similar with the addition of the use of the building fire alarm. While compliance with the building alarms has been shown to be low, it is a start. This too will have to be followed up with door-to-door notification until the Reverse 911 system is available. WBDG will still be helpful here as location of shelter, estimated time the evacuation will last, and other questions can be sent out to residents in English and Spanish. If residents take refuge in their vehicles, the vehicle FM radio can be used.

The second recommendation (Appendix J) flows from the first. To implement using the local high school station, WBDG, as a source for official fire department information, a station policy has to be written. This policy must be supported by the station governing body, such as the school board. Further, so that the use of the radio station can be 24 hours a day, seven days a week, appropriate equipment must be investigated and purchased. The *APCO Bulletin* (LeBow, 1996) indicates such equipment is available.

The final recommendation is included in Appendix K, an action plan to allow WTFD to handle shelter in place and evacuation instructions for large apartment buildings. The recommendation has seven points.

The WTFD should pursue the use of WBDG radio to provide information in and around large apartment buildings where residents need to evacuate or shelter in place.

The SOG should be adopted where the initial notification is made door-to-door by fire department personnel until such time Reverse 911 becomes available.

Evacuation and shelter in place instruction cards should be preprinted in both English and Spanish as explained earlier.

Reverse 911 should be implemented as it is the best way to notify people of an incident.

The county hazmat task force should work with the broadcast media to come up with a consistent policy so that fire departments know what to expect when calling a newsroom telephone line to ask for help.

A public information officer should give information to the media to provide to the citizens if the media is on the scene. This will eliminate frustration as seen in the Canadian fire (Proulx, 1996).

After an incident where evacuation or shelter in place has been used, follow up surveys should be distributed to determine what went well and what can be done better the next time. Some of the information presented in this research was the result of such follow up surveys.

Future readers in large metropolitan areas may want to investigate installing a broadcast band FM radio transmitter in a command van or a similar apparatus. This may not be possible due to the limited number of FM frequencies and the possibility that the Federal Communications Commission rules and regulations have no provision for this. If this were possible, however, it would place the radio transmissions totally under fire department control without interaction required with other agencies.

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Appendix A
Fire Department Survey on Notification to Public

National Fire Academy Damian John Garino
Executive Development Battalion Chief
Applied Research Project December 2002

1) Please indicate the number of people you protect in your department's service area: _____

2) Does your department have a procedure for giving specific instructions to occupants of large residential structures in case of a hazmat incident or fire where there is no internal public address system in place?

Please Circle YES NO   >>If yes, please consider sending a copy in a separate envelope <<

3) Does your department have any formal arrangements with local broadcast media outlets to relay information to occupants of large residential structures in case of a hazmat incident or fire?

Please Circle   YES NO

4) Does your department feel that there is a need, in case of a hazmat incident or fire, to have special provisions for people who cannot speak or read the English language?

Please Circle   YES NO   If no, skip question 5

5) If the answer to the question 4 is yes: In case of a hazmat incident or fire, does your department have any provisions for communicating specific instructions to people who cannot read or speak the English language?

Please Circle   YES NO

Note: Standard Operating Guideline (SOG) is equivalent to Standard Operating Procedure (SOP) for the following questions.

6) Relating to Reverse 911 (an automated system where a call can be made to many specific phones):   Please Circle
   A) Does your department have access to?   YES NO
   B) If yes to 6A has your department used?   YES NO
   C) If yes to 6A does your department have an SOG covering its use? YES NO

7) Relating to a community email alert system   Please Circle
   A) Does your department have access to?   YES NO
   B) If yes to 7A has your department used?   YES NO
   C) If yes to 7A does your department have an SOG covering its use? YES NO

8) Relating to the Emergency Alert System (formally the Emergency Broadcast System):

	Please Circle	
A) Does your department have access to?	YES	NO
B) If yes to 8A has your department used?	YES	NO
C) If yes to 8A does your department have an SOG covering its use?	YES	NO

Please return the survey by mail to Battalion Chief John Garino, Wayne Township Fire Department, 700 North High School Road, Indianapolis, IN 46214. Please return by December 23. Thank you.

Appendix B
Survey Cover Letter

December 7, 2002

Dear Chief:

The Wayne Township Fire Department is in the process of developing a standard operating guideline (SOG) on how to notify occupants of large residential buildings of the need to evacuate, shelter in place, or take other specific actions. This SOG is being developed as part of an advanced research project for the National Fire Academy's Executive Fire Officer program.

Enclosed you will find a short survey, and a stamped return envelope. Please complete the survey at your earliest convenience. The survey should then be placed in the enclosed envelope and returned by mail.

While I realize your time is valuable, the fire academy has a time limit on the completion of the research projects. Your timely response is appreciated. I would like all responses mailed by December 23rd.

If you would like a copy of the survey results, please send your mailing information to the above address under separate cover (to keep the survey anonymous). This request can also be made to jgarino@waynefire.org.

Best wishes for the holiday season.

Sincerely,

John Garino
Battalion Chief

Format changes have been made to facilitate reproduction. While these research projects have been selected as outstanding, other NFA EFOP and APA format, style, and procedural issues may exist.

Appendix C
List of Fire Departments Mailed the Survey

Alamo Heights Fire Department   Alamo Heights, TX

Atlanta Fire Department   Atlanta, GA

Boca Raton Fire Department   Boca Raton, FL

Boston Fire Department   Boston, MA

Boulder Fire Department   Boulder, CO

Bremerton Fire Department   Bremerton, WA

Castle Shannon Fire Department   Castle Shannon, PA

Cincinnati Fire Department   Cincinnati, OH

City of Mesa Fire Department   Mesa, AZ

City of Troy Fire Department   Troy, NY

Clearwater Fire Department   Clearwater, FL

Columbus Fire Department   Columbus, OH

Dayton Fire Department   Dayton, OH

Detroit Fire Department   Detroit, MI

District of Columbia Fire Department   Washington, DC

Fort Worth Fire Department   Fort Worth, TX

Fresno Fire Department   Fresno, CA

Ft. Lee Fire Department   Fort Lee, NJ

Fultondale Fire Department   Fultondale, AL

Gary Fire Department   Gary, IN

Gastonia Fire Department   Gastonia, NC

Germantown Fire Department   Germantown, TN

Hartford Fire Department	Hartford, CT
Holland Fire Department	Holland, MI
Honolulu Fire Department	Honolulu, HI
Indianapolis Fire Department	Indianapolis, IN
Jacksonville Beach Fire Department	Jacksonville, FL
Kansas City Fire Department	Kansas City, MO
Las Vegas Fire Department	Las Vegas, NV
Laurelton Fire Department	Rochester, NY
Los Angeles County Fire Department	Los Angeles, CA
Louisville Fire Department	Louisville, KY
Milwaukee Fire Department	Milwaukee, WI
Newark Fire Department	Newark, NJ
Oklahoma City Fire Department	Oklahoma City, OK
Orlando Fire Department	Orlando, FL
Parma Fire Department	Cleveland, OH
Portland Fire Department	Portland, OR
Richmond Fire Department	Richmond, VA
Salt Lake County Fire Department	Salt Lake City, UT
San Diego Fire Department	San Diego, CA
St. Paul Fire Department	Saint Paul, MN
West Sacramento Fire Department	West Sacramento, CA
San Marcos Fire Department	San Marcos, TX
Worcester Fire Department	Worcester, MA

Niagara Falls Fire Department	Niagara Falls, NY
High Point Fire Department	High Point, NC
Anderson County Fire Department	Anderson, SC
Galveston Fire Department	Galveston, TX
Ft. Lauderdale Fire Rescue Dept	Ft. Lauderdale, FL
Minneapolis Fire Department	Minneapolis, MN
Nashville Fire Department	Nashville, TN
New Orleans Fire Department	New Orleans, LA
Virginia Beach Fire Department	Virginia Beach, VA
Oakland Fire Department	Oakland, CA
Bomberos de Puerto Rico	San Juan, PR
Metro West Fire Protection District	Wildwood, MO
Wilmington Fire Department	Wilmington, DE
Chapel Hill Fire Department	Chapel Hill, NC

Appendix D
Top Sixty Metropolitan Areas Ranked by Census Population

Rank	Area Name	Population
1	New York--Northern New Jersey--Long Island, NY--NJ--CT—PA	21,199,865
2	Los Angeles--Riverside--Orange County, CA	16,373,645
3	Chicago--Gary--Kenosha, IL--IN--WI	9,157,540
4	Washington--Baltimore, DC--MD--VA--WV	7,608,070
5	San Francisco--Oakland--San Jose, CA	7,039,362
6	Philadelphia--Wilmington--Atlantic City, PA--NJ--DE--MD	6,188,463
7	Boston--Worcester--Lawrence, MA--NH--ME--CT	5,819,100
8	Detroit--Ann Arbor--Flint, MI	5,456,428
9	Dallas--Fort Worth, TX	5,221,801
10	Houston--Galveston--Brazoria, TX	4,669,571
11	Atlanta, GA	4,112,198
12	Miami--Fort Lauderdale, FL	3,876,380
13	Seattle--Tacoma--Bremerton, WA	3,554,760
14	Phoenix--Mesa, AZ	3,251,876
15	Minneapolis--St. Paul, MN--WI	2,968,806
16	Cleveland--Akron, OH	2,945,831
17	San Diego, CA	2,813,833
18	St. Louis, MO--IL	2,603,607
19	Denver--Boulder--Greeley, CO	2,581,506

Rank	Area Name	Population
20	San Juan--Caguas--Arecibo, PR	2,450,292
21	Tampa--St. Petersburg--Clearwater, FL	2,395,997
22	Pittsburgh, PA	2,358,695
23	Portland--Salem, OR--WA	2,265,223
24	Cincinnati--Hamilton, OH--KY--IN	1,979,202
25	Sacramento--Yolo, CA	1,796,857
26	Kansas City, MO--KS	1,776,062
27	Milwaukee--Racine, WI	1,689,572
28	Orlando, FL	1,644,561
29	Indianapolis, IN	1,607,486
30	San Antonio, TX	1,592,383
31	Norfolk--Virginia Beach--Newport News, VA--NC	1,569,541
32	Las Vegas, NV--AZ	1,563,282
33	Columbus, OH	1,540,157
34	Charlotte--Gastonia--Rock Hill, NC--SC	1,499,293
35	New Orleans, LA	1,337,726
36	Salt Lake City--Ogden, UT	1,333,914
37	Greensboro--Winston-Salem--High Point, NC	1,251,509
38	Austin--San Marcos, TX	1,249,763
39	Nashville, TN	1,231,311
40	Providence--Fall River--Warwick, RI--MA	1,188,613

Rank	Area Name	Population
41	Raleigh--Durham--Chapel Hill, NC	1,187,941
42	Hartford, CT	1,183,110
43	Buffalo--Niagara Falls, NY	1,170,111
44	Memphis, TN--AR--MS	1,135,614
45	West Palm Beach--Boca Raton, FL	1,131,184
46	Jacksonville, FL	1,100,491
47	Rochester, NY	1,098,201
48	Grand Rapids--Muskegon--Holland, MI	1,088,514
49	Oklahoma City, OK	1,083,346
50	Louisville, KY--IN	1,025,598
51	Richmond--Petersburg, VA	996,512
52	Greenville--Spartanburg--Anderson, SC	962,441
53	Dayton--Springfield, OH	950,558
54	Fresno, CA	922,516
55	Birmingham, AL	921,106
56	Honolulu, HI	876,156
57	Albany--Schenectady--Troy, NY	875,583
58	Tucson, AZ	843,746
59	Tulsa, OK	803,235
60	Syracuse, NY	732,117

Note. From United States Census Bureau (2001)

Appendix E
Population of WTFD Response Area

Census tract	Population	Percent WTFD	Population WTFD
3401.01	4,379	100	4,379
3401.05	8,055	100	8,055
3401.06	7,197	100	7,197
3401.07	5,425	100	5,425
3409	9,287	60	5,572
3417	5,403	70	3,782
3419.01	6,945	100	6,945
3419.02	3,678	100	3,678
3420	3,368	100	3,368
3421.01	4,066	100	4,066
3421.02	0	100	0
3422	5,430	100	5,430
3423	6,536	100	6,536
3424	1,616	100	1,616
3425	4,845	100	4,845
Total	76,230		70,894

Note. Population from United States Census Bureau 2002. Percent WTFD is an estimation of the percentage of the area of the census tract in the WTFD response area. Population WTFD is determined by scaling the total population by the percent WTFD.

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Appendix F
Number of Occupied Housing Units and Telephone Service

Census tract	Owner occupied housing units		Renter occupied housing units	
	Number units	No phone	Number units	No phone
3401.01	1439	7	256	16
3401.05	2719	8	398	14
3401.06	1793	0	1501	10
3401.07	858	0	2081	29
3409	1233	10	1321	23
3417	877	22	626	44
3419.01	585	0	2577	35
3419.02	1310	0	278	5
3420	1064	0	91	0
3421.01	1137	8	425	6
3421.02	0	0	0	0
3422	1259	21	972	31
3423	1839	25	784	55
3424	519	23	149	29
3425	1428	30	425	39

Total number occupied housing units:	29,946
Total number occupied housing units without telephone service:	490
Total percent occupied housing units without telephone service:	1.64%

Note. Population from United States Census Bureau. (2003b) Figures for census tracts 3409 and 3417 are scaled by amount that census tract is in WTFD response area.

Appendix G
Survey Results

Question Number	Total Responses	Yes		No		Not Answered
		Number	Percent	Number	Percent	
2	39	6	15.4%	33	84.6%	2
3	41	16	39.0%	25	61.0%	0
4	41	25	61.0%	15	36.6%	1
5	24	13	54.2%	11	45.8%	1
6A	40	18	45.0%	22	55.0%	1
6B	18	9	50.0%	9	50.0%	0
6C	17	5	29.4%	12	70.6%	1
7A	41	4	9.8%	37	90.2%	0
7B	4	1	25.0%	3	75.0%	0
7C	4	1	25.0%	3	75.0%	0
8A	41	30	73.2%	11	26.8%	0
8B	27	11	40.7%	16	59.3%	3
8C	27	7	25.9%	20	74.1%	3

Question 1: Average population served 267,000

Question 1: Median population served: 173,000

Note. Copy of survey in Appendix A

Appendix H
English Language Ability and Language Spoken at Home

Census tract	Population over five	Speaks English not well or not at all		Speaks at home	
		Count	Percent	Spanish	Other Languages
3401.01	4,113	35	0.85%	84	28
3401.05	7,414	7	0.09%	118	319
3401.06	6,790	34	0.50%	186	275
3401.07	5,094	150	2.94%	220	401
3409	5,125	39	0.76%	129	283
3417	3,408	207	6.07%	369	35
3419.01	6,293	123	1.95%	481	334
3419.02	3,500	17	0.49%	60	73
3420	3,120	17	0.54%	14	149
3421.01	3,686	131	3.55%	152	243
3421.02	0	0	0.00%	0	0
3422	5,046	23	0.46%	117	60
3423	6,055	66	1.09%	158	42
3424	1,555	0	0.00%	8	15
3425	4,458	5	0.11%	14	100
Total	65,567	854	1.30%	2,110	2,357

Note. Population from United States Census Bureau. (2003a) Figures for census tracts 3409 and 3417 are scaled by amount that census tract is in WTFD response area.

Appendix I
SOG Proposal

Shelter in Place Instruction for Large Apartment Buildings

Immediate

1. If incident commander deems it necessary shelter in place at an incident, a rapid door-to-door notification should take place.

2. This door-to-door notification should be done by firefighters in appropriate level of protective gear.

3. These firefighters going door-to-door should quickly hand out preprinted cards with shelter in place instructions in both English and Spanish. If no one answers the door, these instructions should be placed either under the door or just outside the door.

Short Term (1 year)

As above with addition to shelter in place instruction card to tune to WBDG radio for additional information.

Long Term (3 year)

Use door-to-door as supplement to reverse 911 system.

Evacuation Instructions for Large Apartment Buildings

Immediate

1. If incident commander deems it necessary evacuate the building, firefighters in appropriate level of protective gear should be stationed to block passage through any unsafe areas.

2. The building fire alarm should then be activated.

3. Follow up door-to-door notification should be done by firefighters in appropriate level of protective gear.

4. Once outside, evacuees should be handed further preprinted instructions in Spanish and English.

Short Term (1 year)

> As above with addition to evacuation instruction card that evacuees can tune to WBDG radio for additional information.

Long Term (3 year)

> Use door-to-door as supplement to reverse 911 system.

Appendix J
Proposal for High School Radio Station (WBDG)

Short term (1 year)

1)   Get permission for following policy from appropriate station governing body:

- Fire department communications be immediately put on the air.

- Fire department communications remain on the air until fire department no longer feels they are necessary.

- Have control operator assist fire department recording message that need to be played continuously.

2) Long term (3 year)

Purchase equipment to allow fire department remote access to broadcast from station when the station is automated.

Appendix K
WTFD Action Plan

1) Pursue use of WBDG radio station for use to broadcast specific instructions to citizens whenever required.

2) Adopt above proposed SOG.

3) Stock evacuation and shelter in place preprinted cards in English and Spanish on command and hazmat vehicles.

4) Implement Reverse 911 or similar product.

5) Work with county hazmat task force to get area broadcast media to come up with one set of standards for interrupting programming.

6) If an event is otherwise on the media, get fire department instructions to media to give out. Preferred method is to have uniformed fire department personnel be interviewed.

7) Survey people involved after any incident involving evacuation or sheltering in place.