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Emergency Communication for Deaf and Hard of Hearing

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Emergency Communication Effectiveness for Deaf and Hard of Hearing in Victoria, Australia

An Interactive Qualifying Project proposal to be submitted to the faculty of
Worcester Polytechnic Institute in partial fulfillment of the requirements for the
Degree of Bachelor of Science

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ABSTRACT

This project, motivated partly by the recent bushfires, was prepared in cooperation with the Victorian Deaf Society in Melbourne, Australia to evaluate the effectiveness of Victoria's emergency communication system for the Deaf and hard of hearing. The project team compared emergency communication systems in Australia with those of other countries, including the United States, Canada, and the United Kingdom. We conducted onsite interviews and surveys with the Deaf and hard of hearing of Victoria and contacted other important stakeholders. Then, we proposed recommendations to the Victorian Deaf Society aimed to help implement changes that would better alert the Deaf and hard of hearing during emergencies.

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Firstly, we would like to thank the CEO of Vicdeaf, Graeme Kelly, for giving us the opportunity to work for this organization. He provided us with the problem statement and suggested areas of research in order to have a thorough report. In addition, Mr. Kelly provided us with helpful feedback on our proposal as well as suggestions for valuable contacts. We would also like to thank David Peters for his help with our project. Mr. Peters is an Information Officer for Vicdeaf as well as a respected and well known member of the Deaf community. He was able to give us useful feedback on our project and played a significant role in contacting the Deaf and hard of hearing in Victoria. His help was monumental in obtaining the opinions and suggestions of this Deaf community.

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provided us with the Auslan videos of our questions, put the survey online, and created a link on the Vicdeaf website. He also helped to spread the word about our survey through Vicdeaf's newsletter. In addition, Mr. Parremore participated in an interview and provided us with helpful suggestions and potential contacts. We would also like to thank Sasha Hough for her help in the creation of the videos.

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EXECUTIVE SUMMARY

Natural disasters are extreme forces of nature that impact millions of people worldwide. In Australia, the most prevalent disaster is bushfires; Australia is struck with 20,000 – 30,000 bushfires per year, and the state of Victoria is one of the most affected (Vicdeaf, 2010). As such, it is crucial for Victoria to have an effective emergency communication system to warn its community about these dangers. Australia uses several methods for sending out emergency information; these include using a Short Messaging System (SMS), news flashes across a television, updated websites, radio broadcasts, emergency sirens and other media (e.g. newspapers).

Though media announcements generally work well for a majority of the population, they do not work effectively enough for the Deaf and hard of hearing community of Victoria. This was brought to light during Australia's worst series of bushfires ever recorded on February 7, 2009, which became known as Black Saturday. In total, 173 people were killed, over 500 more severely injured, and over 2,000 homes were destroyed (Hill, 2009). To warn the citizens of Victoria of the imminent disaster, SMS messages were sent out informing the recipients to listen to their local Australian Broadcasting Corporation (ABC) radio station to find out more information. Such a message does not help a Deaf or hard of hearing person. Furthermore, many homes quickly lost power, rendering television and computers useless for emergency warnings.

Recognizing this, the Victorian Deaf Society (Vicdeaf) has been working to improve Victoria's emergency communication system for its Deaf and hard of hearing community. Regarding the current system, a Deaf professional knowledgeable about emergency communications from Vicdeaf reported the belief that Deaf and hard of hearing people are always at a disadvantage in terms of receiving emergency information. Vicdeaf asked our team to evaluate the current emergency communication system's effectiveness for the Deaf and hard of hearing population in Victoria. Our tasks included researching foreign emergency communication systems, obtaining the Deaf and hard of hearing community's opinion of the current system, deciding what aspects work particularly well or poorly, and suggesting possible changes to be made to improve the system. The team divided the project into four main objectives:

1. Compare warning methods of the current emergency communication systems in foreign countries
2. Evaluate the Victorian Deaf and hard of hearing community's level of satisfaction with the emergency communication system, and identify particular aspects of the system that they find either especially helpful or challenging
3. Investigate potential challenges to implementing changes to the emergency communication system in Victoria.
4. Recommend steps that can be taken to increase the effectiveness of the warning system for Deaf and hard of hearing persons.

Before arriving at the project site, we conducted background research on emergency communication systems in Australia and foreign countries. Australia has a country-wide system, but for the most part, the responsibility for emergency communications is given to individual states and territories. We also researched legislation pertaining to the rights of the disabled. Although the Deaf and hard of hearing do not consider themselves disabled, this connotation is useful for legal rights to be granted. The countries researched were the United Kingdom, United States, Canada, South Africa, Spain, and Greece. These countries were chosen either because they are technologically advanced or they are also very bushfire prone. We then conducted research on an international early warning system that is currently being developed.

After interviewing 24 people and receiving 50 surveys from Victoria, several points were made very clear. First, the Deaf and hard of hearing community is not satisfied with the current emergency communication system. Many complaints have been raised with current methods of emergency warnings, such as SMS messages not taking the Deaf and hard of hearing community into account, and television news flashes not being clear. Second, the Deaf and hard of hearing need to be better educated about what systems are available. Many were not aware of national emergency communication systems such as Emergency Alert, and do not have an emergency plan. Finally, the interviews and surveys also showed us exactly which changes the Deaf and hard of hearing would like to see made. These include the Country Fire Authority having a list of all Deaf and hard of hearing people in its region, improving SMS warnings, and having an

interpreter translate news flashes into Australian Sign Language, because many Auslan users do not have high English literacy.

In addition, the challenges that could potentially arise which would hinder the implementation of the team's recommendations were considered. While analyzing the results of all background research, interviews, and surveys, the team considered several groups of stakeholders – the Deaf and hard of hearing community, companies and organizations responsible for emergency communications, and the hearing population. It was important to include more than just the Deaf and of hearing because some of the recommendations would affect more than this specific community in terms of cost, time, and ways in which warnings are received. To determine the challenges that may arise in response to any recommendations, the team contacted several organizations and governmental agencies to inquire about any obstacles that could arise.

After referencing the background research on foreign countries, data from the Deaf and hard of hearing surveys and interviews, and analysis on potential challenges, the team made recommendations in six areas: preparedness, emergency telephone lines, SMS, television broadcasts, websites and email, and personal notifications. The team felt that the most major recommendations were to have the office of Emergency Services Commissioner provide an extensive website specifically for the Deaf and hard of hearing, have organizations for the Deaf advocate individual preparedness and networking, have Deaf and hard of hearing representatives involved in the planning of the emergency system, and provide captions on all emergency television broadcasts. Many other important recommendations were made, as well as explanations and examples of how they could be implemented.

The team concluded that the provided recommendations would best improve Victoria's emergency communication system. They not only help the Deaf and hard of hearing, but most of them also help the hearing population become better informed. The most common problems with these recommendations are determining who will pay for them and getting them implemented quickly. Although there are several methods for covering this cost and moving the process along, the primary method seen in other countries is mandating the changes with disability legislation. The team concluded that these recommendations will ultimately help the Deaf and hard of hearing community of Victoria be properly warned of emergencies.

CHAPTER 1: INTRODUCTION

Natural disasters are extreme forces of nature that impact millions of people worldwide. For example, the 2004 tsunami in the Indian Ocean took between 225,000 and 275,000 lives and the 2010 earthquake in Haiti killed about 230,000 (Dade, 2010; CBC News, 2009). While the destruction caused by these disasters cannot be eliminated, steps can be taken to reduce the death and damage they cause. A critical tool in the effort to reduce damage is an emergency warning system which is used to notify people of imminent danger and allow them to get to safety. However, these emergency warnings do not always reach all populations equally; the Deaf and hard of hearing, for example, are especially vulnerable in times of disaster because they cannot hear sirens or other audio alerts. Specifically for wildfires, many of the alerts are based on an audio alarm or warning which does not reach the Deaf or hard of hearing. Wildfires generally occur in extremely dry regions, and there are approximately 2.5 million bush, grass, and rubbish fires every year (Wanger, 2006). An effective wildfire warning system can notify people of the location, severity, and direction of the fire, as well as provide instructions on where to go to escape the fire. However, the approximately 70 million Deaf people worldwide would not hear audio warnings and therefore would not be equally informed of this vital information (World Federation of the Deaf, 2010). While there have been improvements in fire safety and awareness, worldwide these advancements have not fully addressed the needs of the Deaf and hard of hearing

Victoria, Australia has a particularly urgent need of a new system of emergency communication for the Deaf and hard of hearing. Australia is struck with 20,000 - 30,000 bushfires per year, and Victoria is one of the regions greatly affected (Vicdeaf, 2010). Victoria has a population of 2,172 sign language users (30.4% of Australia's sign language users), which leaves a significant number of people exposed to the yearly danger of bushfires (ABS, 2007). This specific population was vulnerable on February 7, 2009, the day Victoria saw one of the worst bushfires in Australian history. That day became commonly known as Black Saturday. The Black Saturday fires killed 173 people and resulted in severe injuries to more than 500 more. They also destroyed over 2,000 homes (Hill, 2009). Much of the destruction caused by these fires was a result of people not being well informed of the fires and not receiving adequate updates on the severity of the fires.

In the aftermath of Black Saturday, a Royal Commission was established to determine the reasons that these fires were so severe and damaging. Based on their findings, the Commission developed several recommendations designed to improve fire response systems and prevent such extreme damages in the future. An important part of these recommendations was the creation of a new plan of communicating emergencies in Victoria. The new system consists of: a redesigned fire risk rating system to increase awareness of a fire's severity, a Short Messaging System (SMS) that will relay information to mobile and fixed phones, television broadcasts with special fire warnings, up to date information on the Country Fire Authority website, and an information phone line with increased capacity (Brumby, 2009). This new system is being tested and hopefully will decrease the damages of future fires. However, the needs of the Deaf and hard of hearing have not been specifically addressed in this plan.

Although the SMS system and the website updates can be utilized by the Deaf and hard of hearing community, they have not been tested for this particular population. In the absence of testing, it is not clear that this system will be effective for the Deaf and hard of hearing. The opinions of the community and their willingness to use this new system are still unknown. Also, since the elderly comprise a large portion of the Deaf and hard of hearing, that population may not be as comfortable using technology such as mobile phones or computers. A better understanding of the specific needs of the Deaf and hard of hearing community with regard to the new warning system is necessary to ensure that this community is effectively served by the new system.

This project will evaluate the emergency communication system in place in Victoria, Australia and will identify the needs of the Deaf and hard of hearing community regarding emergency warnings in times of disaster. The project team will conduct in-depth interviews on site with members of the Deaf and hard of hearing community and with employees of the Victorian Deaf Society. A survey will be administered to measure the Deaf and hard of hearing community's level of satisfaction with Victoria's emergency communication system. Analyzing this data will allow the team to determine what problems the Deaf and hard of hearing are encountering and whether there are parts of the system that need to be changed. Recommendations can then be made as to how to improve the emergency communication system and increase the level of safety for the Deaf and hard of hearing community. Determining potential challenges that could prevent or hinder implementation of these recommendations,

through contacting various organizations involved, will provide Vicdeaf with a complete picture of the implementation process.

CHAPTER 2: BACKGROUND

This project addresses the emergency communication system in Victoria, Australia post-Black Saturday and, more specifically, its effectiveness in alerting the Deaf and hard of hearing. The following section explores disasters and warning systems in general. Next, the challenges faced by the Deaf and hard of hearing and why they are in need of a new emergency communication system are described. The third section details natural disasters in Australia and how the different states are addressing the Deaf and hard of hearing community's needs for a specialized alerting system. Next, we examine emergency alerting systems around the world focusing on the United Kingdom, the United States, Canada, South Africa, Spain, and Greece. We also describe international emergency communication systems and consider whether they address the needs of the Deaf and hard of hearing. The last section describes the Victorian Deaf Society and its goals. By helping to implement a warning system that can effectively communicate to the Deaf and hard of hearing community during emergencies, the Victorian Deaf Society can help to ensure the safety of Victoria's Deaf and hard of hearing community and become an example for the rest of Australia to emulate.

2.1 Disasters and warning systems

Communicating to the Deaf and hard of hearing during emergencies is challenging because the primary warning system used in most areas around the world is based on sound. Therefore, Deaf and hard of hearing citizens need a specialized system of communication in order to respond to an emergency. This section will investigate warning systems in general and their importance in saving lives during an emergency.

Having an effective emergency warning system is critical for the safety of a community. Global awareness of this issue was heightened after the Indian Ocean tsunami in December, 2004. In addition to a great deal of damage, about a quarter of a million lives were lost. In the study done afterwards to analyze the emergency communication system, one of the frustrating discoveries was that a warning of the tsunami had been available online about an hour in advance. The warning never reached the people of Sri Lanka (Gow, 2007). This strongly suggests that having the technology in place is not enough; a warning system needs to reach the

maximum number of people in the fastest way possible in order for an emergency plan to be put into action.

A successful emergency warning system can be illustrated in the experiences of the small fishing community of Taro in northeastern Japan. In 1933, when a tsunami hit the town, almost a thousand lives were lost as well as about five hundred homes. The event was devastating for this community, but the people responded to this tragedy by building an emergency warning system. Now, as soon as the town is aware of a possible tsunami, a warning is broadcast both over loudspeakers throughout the community and in each individual household. In addition, the citizens of Taro run practice drills about once a year. Taro's emergency response system was put to test in 1960 when another huge tsunami hit the coast of Japan. Not a single life was lost in Taro, partly due to the warning system. About 150 people died in the surrounding areas (Moffett, 2005).

Tsunamis are not the only disasters that require emergency warning systems. The Kobe earthquake that hit Japan in 1995 resulted in about 6,000 deaths and 35,000 injuries. This happened in a high risk area where a great earthquake was expected, but advanced preparation had not been a major focus of either the government or the public (Goltz & Tierney, 1997). This raises the question of how many lives would have been saved if there had been an emergency warning system.

In addition to natural disasters, emergency warning systems can be critical for manmade disasters. In the September 11, 2001 terrorist attacks in the United States, planes were flown into both buildings of the World Trade Center in New York City, New York, as well as into the Pentagon in Washington, DC. The plane crashes resulted in either serious structural damage or collapse of the buildings, and about 2,800 people were killed (New York Magazine, 2002). Eighty floors of both World Trade Center towers were unaffected for almost an hour after the crash, but lives were still lost. Due to lack of accurate information and direction, people stayed in the towers instead of fleeing, and died as a result (Kwan & Lee, 2005). This event caused American researchers to investigate types of emergency warning systems. For example, a real-time three dimensional Geographic Information System (GIS) was proposed because it would be much more effective than a two dimensional GIS in a setting like New York City where there are numerous high rise buildings. This system would be able to provide accurate, real-time data which would enable correct evaluations to be made and emergency warning plans to be

implemented quickly so the risk to the population could be reduced as much as possible (Kwan & Lee, 2005). This shows that disaster events commonly reveal the inadequacies of existing emergency warning systems. Post-disaster, these systems are reevaluated and updated to address new needs.

2.2 The Deaf and hard of hearing

The World Federation of the Deaf estimates that there are about 70 million Deaf and hard of hearing people in the world, and the Institute of Hearing Research estimates that in the next five years the number of people experiencing a noticeable hearing loss will reach over 700 million (World Federation of the Deaf, 2010, Music Motion, 2010). As seen in Figure 1, the number of Deaf and hard of hearing people in Australia is expected to increase by two-fold from 2010-2050 due to an aging population (Vicdeaf, 2006). However, there is no universal definition of Deafness or hearing loss, and because these numbers are estimates, they may not accurately represent the true number of Deaf and hard of hearing. Furthermore, even if individuals could benefit from hearing aids, if their hearing loss does not inhibit their daily routine, those individuals may not consider themselves to be hearing impaired at all (FEMA, 2009).

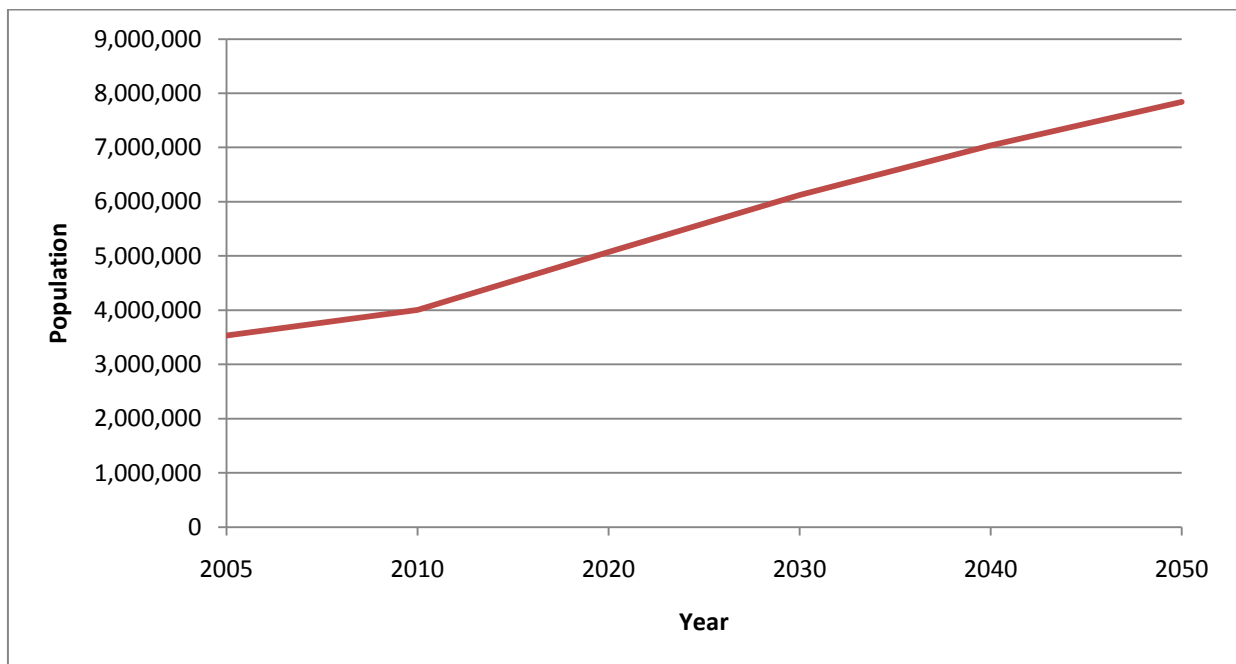


Figure 1: Projected Hearing Loss Prevalence in Australia (Vicdeaf, 2006).

Perhaps the most objective way to medically define hearing loss is to base it on the decibel range loss of the individual. Their range can then be generalized into an overall description, as shown below in Table 1 (Peters, 2010, Willoughby, 2009). This system has many problems however, such as the fact that many Deaf people do not go to get tested. Especially when someone has profound hearing loss, there is no reason for them to test their decibel range. Also, the Deaf community “strongly rejects medical models of Deafness because of their connotations of Deafness as something that needs to be ‘fixed’ and instead identify as a linguistic and cultural minority with their own rich traditions, language, and culture” (Willoughby, 2009). This identification could be loosely compared to a mono-lingual person trying to communicate in a country in which he or she does not speak the language. For this reason, the severity of hearing loss is often determined on a more cultural basis, such as whether or not the individual is fluent in Auslan, Australia’s sign language.

Degree of Hearing Loss	Equivalent Decibel Loss	Effects
Normal hearing	0-20 dB	No effects in good listening environment.
Mild hearing loss	21-45 dB	Understanding speech can be difficult. Has difficulty understanding in a noisy environment.
Mild to moderate hearing loss	46-60 dB	Has trouble hearing and understanding in ideal conditions. Unable to follow what is said in large open areas. Hearing aids can assist.
Moderate to severe hearing loss	61-75 dB	Communicates with significant difficulty under all conditions. Needs visual clues. Hearing aids can assist but may still have poor clarity of speech.
Severe hearing loss	76-90 dB	Unable to hear normal speech, depends on visual clues (speech reading or sign language). Hearing aids assist with some speech sounds and identifying environmental sounds.
Profound hearing loss	91+ dB	Considered Deaf. May hear some loud sounds. Does not rely on hearing as primary channel for communication. May wear hearing aids to assist with environmental and warning sounds and the rhythm of speech.

Table 1: Severity Levels of Hearing Loss (Peters, 2010, Willoughby, 2009)

Auslan is a visual language that combines hand motions and facial expressions to convey meaning and tone. It originated in Britain but evolved in the Australian culture to its modern form. Britain, Australia, and the US now all use different forms of sign language that use

gestures of the hands, body, and face. By using these motions, sign language users are able to communicate as effectively as a spoken language. The sentence structure is different from that of English, but interpreters can translate from one language into the other (Peters, 2010).

Within the Auslan-speaking community there is a broad range of backgrounds. There are Deaf people born into a Deaf family who grow up using Auslan and learn English at home or at school. Then, there are Deaf people born into a hearing family who generally learn Auslan later in life and use oral methods to communicate at home. Finally, there are those who were born hearing but who lose the ability to hear over time. They may use hearing aids and/or learn Auslan, but may still have problems communicating (Peters, 2010).

To help non-hearing and hearing people communicate, a variety of technologies have been developed. For television broadcasts, captions referred to as teletext can be added to the bottom of the screen that describe what is happening and what is being said. A Teletypewriter (TTY) can be used in place of a telephone, which allows the non-hearing person to type and read text instead of speaking and listening. If the message is going to a hearing person, a relay operator can be used to send the message verbally to the person on the other end. Other technologies such as Short Message Service (SMS) and video conferencing with interpreters can also be used (Peters, 2010).

Since Deaf and hard of hearing people simply use a different method of communicating, many of them do not consider themselves to be disabled in any way. David Peters, a Deaf representative from the Victorian Deaf Society, states that “Deaf people are not really disabled. We don’t need all the additional supports; it’s more that we just cannot hear. Once I can receive information...then I can act the same way that you would” (Gerritsen and Pedler, 2008). However, sometimes ensuring that a Deaf or hard of hearing individual receives the information can be challenging.

2.2.1 The needs of the hearing impaired

Even though the Deaf and hard of hearing around the world do not really consider themselves to be disabled, they are covered under disabilities acts in many countries that make discrimination unlawful and try to promote equal access and opportunities for everyone. These acts focus on providing equality in areas like employment, education, transport, and information, and cover a variety of people with either mental disorders or those with physical, sensory, or

intellectual disabilities. Deaf people are considered to have a sensory disability and therefore are able to benefit from these acts (Australian Human Rights Commission, 2010).

Although Deaf and hard of hearing Australians fall under the Disability Discrimination Act of 1992 which entitles them to equality in education and information, there are currently no specific laws or regulations in place that guarantee that resources like closed captioning or interpreters are available so they actually receive the information. In contrast, the United States' Americans with Disabilities Act ensures that the Deaf and hard of hearing receive the same privileges and accommodations as the rest of the population. Many estimates indicate that America could have more than 500,000 American Sign Language users. Because this is such a significant number of people, a lot of work has been done to guarantee that their needs are met. For example, all national broadcasts must include a captioning so the information is conveyed effectively (Mitchell, Young, Bachleda, & Karchmer, 2005). In comparison, Australia has slightly over 7,000 Auslan users, so at this point less has been done to guarantee that they are provided with the same benefits (ABS, 2007).

One example of how emergency information is not reaching Australians with hearing loss is in the education of fire safety. People take for granted commonly taught elements of fire safety, such as the "stop, drop, and roll" method, but the ways in which these methods are taught in school are not always oriented toward the specific needs of the hearing impaired because they are a minority. Because their educational needs are not always considered, Deaf and hard of hearing people are often not as up to date with the current technology or safety procedures (FEMA, 1999).

Those with hearing loss are at a higher risk than others in an emergency due to problems in education, issues with how emergency information is conveyed, and communication barriers between the hearing and the Deaf and hard of hearing populations. Due to the fact that the reports describing the victims of an emergency do not indicate hearing level, it is difficult, if not impossible, to figure out the consequences of this higher risk (FEMA, 1999). However, many express the belief that the system needs improvement.

There are numerous areas that need to be improved before the emergency warning system sufficiently reaches the Deaf and hard of hearing in Australia, but one example of an area that is already being addressed is smoke alarms. According to the Metropolitan Fire Brigade's (MFB) Fire Safety Information Sheet, smoke alarms became a requirement in Victorian homes as of

February 1999 (Metropolitan Fire Brigade, 2007). However, conventional smoke alarms warn people of smoke or fire by a loud beeping sound. Even though the Deaf and hard of hearing population are not able to benefit from this type of alert, it is the only type that is required. According to the Australian Standard regarding smoke alarms, A.S. 3786, it is only required that there be a smoke detecting unit; there are no specifications that it needs to have any type of warning besides sound (Metropolitan Fire Brigade, 2007).

There are other types of fire alarms that would better meet the needs of the Deaf and hard of hearing. Some smoke alarms are equipped with a white flashing light, and others can even be connected to a vibrating pad that is placed under a Deaf person's pillow. Even though these specialized smoke alarms are not mandatory, the Deaf and hard of hearing are able to purchase them on their own. (Metropolitan Fire Brigade, 2007).

Although these specialized smoke alarms are available to the hearing impaired population, they cost upwards of \$450 which is beyond the reach of many (Minister for Community Service, 2009). The United States and the United Kingdom both provide these specialized alarms free of charge to the Deaf and hard of hearing. Australia is slowly working to provide these alarms because they are a critical tool in warning the Deaf and hard of hearing (Gerritsen and Pedler, 2008). Since 1999, the Victorian Government, in collaboration with other organizations, has launched programs that help make these expensive specialized smoke alarms more affordable to the Deaf and hard of hearing population. According to Graeme Kelly of the Victorian Deaf Society, helping to provide these smoke alarms is important because very few Deaf and hard of hearing people can afford them. Without these specialized smoke alarms, they are at a much greater risk than most of the population in the case of a fire (Neville, 2009).

In 2006, the Victorian Government Auslan Fire Alarm Subsidy was launched. This program was administered by the Victorian Deaf Society, and was created to provide 600 specialized smoke alarms to profoundly Deaf Auslan users at a more reasonable price of \$50. The smoke alarm provided by the scheme, the Bellman Visit alarm system, is fairly easy to use and set up, conforms to all relevant Australian Standards, and is battery operated. Furthermore, it provides a combination of both vibrating and visual warnings, which is strongly recommended by the Australasian Fire and Emergency Services Authorities Council (AFAC). With the combination of warnings, the stimulus is much more effective at waking a sleeping person (Willoughby, 2009).

These Bellman Visit alarms were available to fluent Auslan users who were over 18, did not live in public housing, or who were not eligible to receive a smoke alarm from another source of government funding. Due to the success of the program and continued demand, the subsidy was extended through 2011 and was expanded to include teenagers with severe hearing loss in both ears. In addition, the original limit of one specialized smoke alarm per household was removed to address the situation of Deaf and hard of hearing people sleeping in different bedrooms (Willoughby, 2009).

These flashing fire alarms are a critical tool in warning the Deaf and hard of hearing in the case of a fire (Gerritsen and Pedler, 2008). However, these specialized smoke alarms are not the only tool that needs to be set in place, especially in a country as fire prone as Australia. Because bushfires are a common occurrence, it is important that Australians do all that they can to remain safe. The most essential part of dealing with bushfires is to be prepared for them. The Metropolitan Fire Brigade (MFB) emphasizes that the most dangerous situations occur when people try to flee at the last moment. (Metropolitan Fire Brigade, 2007). To ensure their safety, residents need to leave their home several hours before the bushfire arrives.

The key to making this decision to leave early is being aware of bushfire warnings. Unfortunately, this is another area where the Deaf and hard of hearing people are at a disadvantage. Bushfire warnings are typically broadcast through either radio or television, both of which use sound as a primary means of communicating. Beng Lindqvist, a United Nations spokesperson for disabilities, says “As long as disabled people are deprived of equal opportunities for full social participation, nobody will be able to say that the objectives of the Declaration on Human Rights have been achieved” (Handicap International, 2010). Although the Deaf and hard of hearing may not place themselves in this “disabled” group, changes need to be made to assure that the Deaf and hard of hearing community’s right to access the same emergency information as the rest of the population is met.

2.3 Natural disasters and communication systems in Australia

Although Australia is not as prone to tsunamis or earthquakes as other countries, it has its share of natural disasters. One of Australia's problems is that of cyclones, but luckily they do not occur very often in populated areas. There are many cyclones formed in the Northern region of Australia, but they are not usually powerful enough to cause destruction. In other areas of

Australia where there are deserts, drought is a common problem. With little precipitation, the area is very dry. Due to the low humidity, in addition to hot temperatures, every summer Australia faces its most destructive natural disaster: fire (Yesaustralia, 2006). This section discusses how bushfires have affected Australia in recent years, and how the emergency communication system in Australia (on both a national and state level) notifies its citizens of emergencies.

2.3.1 Bushfires

During the summer months Australians face the dangers of bushfires. Bushfires are a common occurrence that cause extensive property damage or even death. Fire brigades distribute information to their local communities about the proper ways to respond to a fire and how to best prepare their home and property. In the case of bushfires, warnings are sent out to the citizens so that they will have an adequate amount of time to either leave their home safely or prepare to stay and defend their house against the fire.

Despite the number of bushfires that Australians have experienced, in February 2009 it became evident that Australians were still was not fully prepared. The Black Saturday fires caused unprecedented destruction; 173 people were killed and 500 more were seriously injured. In addition to the human casualties, over 2,000 homes were lost (Hill, 2009). Figure 2 is a photograph taken of the Black Saturday Fires showing the intensity of the fires.



Figure 2: Black Saturday fires (Malkin, 2010)

Because the effects of Black Saturday were so much more disastrous than previous fires, many began to look into Australia's emergency system to see where it failed. The basic principle behind Australia's system was to "stay and defend, or leave early" when dealing with bushfires (AAP, 2009). After meeting in 2008, the Ministerial Council for Police and Emergency Management decided that this system was no longer acceptable.

2.3.2 National emergency system

As of December, 2009, Australia has implemented Emergency Alert, a system for warning the population of emergencies via mobile phones and landlines (Emergency Alert, 2010). It is used to send either an SMS message to a mobile phone, or a voice message to a landline; either way, the message contains information pertaining to that emergency. Since it began operation, Emergency Alert has been used 32 times, sending out over 109,000 messages, for flood, tsunami, and bushfire warnings. However, these messages are just to notify people that there is an emergency. It does not detail what a person should do or how to prepare for that emergency; rather it only provides them with somewhere else to look for more information.

Another important medium for emergency warnings is the Australian Broadcasting Corporation (ABC) which comprises government television and radio stations. They report warnings on their stations and also have information on their websites that explains the fire danger rating scale, how to prepare for a bushfire, and what to do when a warning has been issued. According to Geoff Cousins, Captioning and Compliance Coordinator for ABC, all news flashes such as emergency information and warnings are captioned live (Cousins, 2010). The ABC television stations have closed captioning available to their viewers for over 90% of their programs from the hours of 6 a.m. to midnight. The current Australian government legislation requires all free-to-air television stations to provide captioning from only 6 p.m.-10:30 p.m. Closed captioning is provided to the ABC through Caption It, a captioning company. Caption It has employees on call 24 hours a day, so most emergencies should be captioned.

2.3.3 National emergency system for the Deaf

Australia uses the telephone number 000 as its main emergency contact number. However, this service number is currently only available via telephone. A Deaf or hard of hearing person must use the number 106. It was made specifically for Deaf and hard of hearing

people, and provides the same services as the 000 number. However, it requires the use of a computer with a modem or a TTY device; it is not available for use via mobile phone. This is not practical, as TTY devices are not designed for portability, making this service relatively unusable for Deaf and hard of hearing people unless they are at home.

Other than these national systems, most of the responsibility of distributing emergency information is still imposed upon the individual states. Each state has different approaches for handling emergency situations. The approaches of the states with a significant Deaf and hard of hearing population are detailed in the following sections.

2.3.4 New South Wales

The state of New South Wales has recently been using text messaging technology to communicate more effectively with its Deaf and hard of hearing community, which contains 1,959 sign language users (Eardley, Bruce, & Goggin, 2009; ABS, 2007). More specifically, the use of the Short Messaging Service (SMS) and TTY has been implemented. SMS allows companies, websites, and organizations to send quick messages to their subscribers via text messaging. This allows for information to be sent to many users very quickly. The main drawback of SMS is that it usually only allows one-way communication; the recipient of the SMS message cannot reply back to the sender. Therefore, if the user wishes to receive more information about the message, he or she will have to use another means to do so.

Unlike the SMS, the TTY system allows for a Deaf or hard of hearing person to inquire more information about emergency situations. However, TTY devices are not portable, are generally expensive, and take a longer time to use than a regular phone call. For these reasons, it has been difficult for New South Wales to fully implement a standard TTY system for its Deaf and hard of hearing population (Eardley, Bruce, & Goggin, 2009).

2.3.5 South Australia

South Australia uses radio communication and television as its main means of conveying information to the public (Giles-Clark, 2004). Radio communication often does not directly help the Deaf and hard of hearing community become well-informed about emergency situations. Television, on the other hand, is plausible for effective communication. As of February 2010, the South Australian government requires that all government television commercials and

programs include captioning; commercials must have closed captioning, and videos produced containing public information must have open captioning (Government of South Australia, 2010). Closed-captioning is a system that displays text on a television screen to provide the viewer with a transcript of a program, including non-speech elements. Open captioning provides the same service, but may not be turned off, unlike closed captioning. However, there is an amendment to this requirement which states that captioning does not have to be included if the message is “produced within a timeframe which precludes the opportunity for captioning” (Government of South Australia, 2010). Therefore, all last-minute emergency warnings do not need captioning if it would take too much time to do so. This means that televised warnings are still not completely reliable for the Deaf and hard of hearing.

For further communication with its population of 624 sign language users, South Australia relies on the Internet (ABS, 2007). The state’s main Deaf and hard of hearing community service provider is DeafCanDo. DeafCanDo’s website provides videos with news about all major events (not just emergencies), which are all in Auslan. The videos also have subtitles for people who do not use Auslan. However, other than DeafCanDo’s advancements, there is not much research underway to specifically improve emergency communications for the Deaf and hard of hearing.

2.3.6 Victoria

Following Black Saturday, Victoria established a Royal Commission to evaluate the state’s emergency communication system. The Commission released an interim report in August, 2009 detailing its findings up to that point. The report concludes that there were many flaws in the system, ranging from what branch of government is responsible for sending out messages to how the messages are actually sent (Royal Commission, 2009).

In response to the report, the Victorian government released a revised Emergency Management Manual, detailing what government authority is responsible for different emergencies. The Country Fire Authority (CFA), Metropolitan Fire and Emergency Services Board (MFESB or MFB), and the Department of Sustainability and Environment (DSE) are responsible for responding to bushfires. Which authority responds to a bushfire depends on the fire’s location; or, if the fire is severe enough, more than one of these organizations are likely to respond (Office of the Emergency Services Commissioner, 2010).

After Black Saturday, the CFA developed two community programs to better educate residents about bushfires – Community Meetings and Community Fireguard. Community Meetings are organized meetings held by the CFA during the summer to inform citizens how to prepare for a bushfire and how to develop a survival plan. The Community Fireguard is a survival plan within a community, designed to reduce bushfire damage. They are formed when a neighborhood decides to join the program; the neighborhood group is trained by a member of the CFA on how to respond together in the case of an emergency. These groups form telephone trees to alert each other in the case of an emergency warning, and have a plan on how to react as a group in the case of a bushfire (Appendix F).

There are several organizations responsible for informing the public about emergencies. ABC Radio, the government radio station for Australia, must broadcast information over its station, and must be active 24 hours a day. The Bureau of Meteorology must provide information to the media to inform the public via radio and Internet. The CFA is responsible for providing advice to threatened counties on actions they should take during an emergency. The Department of Human Services is mostly in charge of post-event services, such as recovery and support. The DSE must develop and manage programs to reduce the risk of bushfires, as well as support the CFA. The Emergency Services Telecommunications Authority is responsible for Victoria's 000 emergency telephone line and providing information for the public about emergencies. The MFB responds to fires and must support other firefighting agencies. Municipal councils (an area's local government council) are responsible for facilitating the delivery of emergency messages to the public and to the media. Lastly, the Victoria State Emergency Service is responsible for providing information to the public (Office of the Emergency Services Commissioner, 2010).

Also as a response to the interim report, Victoria has a new system in place for relaying emergency messages to its citizens. There are three categories of messages – advice messages, watch and act messages, and emergency warnings. An advice message means that a fire has ignited, but it is not dangerous to those receiving the message. A watch and act message means that a fire is approaching the recipient, and preparations must be made to stay protected from the fire. An emergency warning (the highest category) means that the recipient is in serious danger (Office of the Emergency Services Commissioner, 2009).

The content of each message depends on multiple factors, such as the fire's size, location, speed, and direction. Usually, the message will detail an estimated time of impact (if applicable),

the counties that will be affected, and the current level of danger from the fire. The message will also contain specific advice for what the recipient should do (Office of the Emergency Services Commissioner, 2009).

The messages are sent out over several media. The fastest way to receive the message is to listen to a local ABC Radio station or log on to the Bureau of Meteorology, Country Fire Authority or Department of Sustainability and Environment websites. The messages are also broadcast on television and published along with weather reports in newspapers. Furthermore, if the message is an emergency warning, a Standard Emergency Warning Signal (SEWS), a distinctive warning siren warning sound, is used to warn citizens. If a person wishes to seek out further information, he or she can contact the Victorian Bushfire Information Line via telephone, TTY, or email (Office of the Emergency Services Commissioner, 2009). Victoria is also beginning to implement state-wide telephone warnings, whereby a person may receive a voice recording on a landline phone, or an SMS message on their mobile phone (Office of the Emergency Services Commissioner, 2009).

The Victorian government released the Disability Act of 2006, which took effect in July of 2007 and was updated in 2010. Whereas the Disability Discrimination Act of 1992 covers the entirety of Australia, the Disability Act of 2006 was made specifically for Victoria. This Act guarantees the rights of all disabled persons to have the same ability as non-disabled citizens to “access information and communicate in a manner appropriate to their communication and cultural needs” (Department of Human Services, 2010), including information about emergencies. For the Deaf and hard of hearing, this means that they have the right to receive the same information as the hearing population, even if it is needed in a different form.

2.3.7 Potential systems for the Deaf

Although the government has just recently started to use SMS messages to send out warnings about emergencies, other organizations in Victoria already use SMS messages for different reasons. These organizations are working to make their services more accessible to all of their clients, including those with a disability. Yarra Trams and the Metro are two examples of organizations that have put systems in place to benefit their customers, and, more specifically, benefit the hearing impaired.

Yarra Trams, the tram service in Melbourne, has recently implemented a new system called tramTRACKER in collaboration with the Victorian Government and a company called Message Media (Marshall, 2010). For a fee of about 25 cents passengers are able to call the tramTRACKER number, state their Tracker Stop ID (which is posted at each tram stop), and will be notified of when the next three trams are expected at their location. Passengers are also able to request this information by SMS, which greatly benefits the Deaf and hard of hearing community. By sending an SMS with their Tracker Stop ID to 199YARRA, they can receive the same information about the next three expected trams for 55 cents. If passengers have a mobile phone with Internet, they can also find the information on the tramTRACKER website for no additional charge (Yarra Trams, 2009).

TramTRACKER also offers a unique feature where a passenger can use his or her iPhone to follow the progress of a specific tram. By downloading a specific iPhone application, the passenger will be able to use the iPhone to find what trams are expected at a certain tram stop. The iPhone will also be able to provide the exact distance to all of the closest tram locations from the user's location as well as a map of these stops. If the passenger is interested in a specific route, he or she can find out where all of those trams are currently located around Melbourne. Once on a tram, the passenger can enter the tram ID into the iPhone and follow the progress of the tram. He or she can see the tram stops on the route, the time they reach the stop, and the expected time they will reach stops further down the route (Yarra Trams, 2009).

The Metro has a similar system to update its passengers about train times. Melbourne's Metro is run by Connex Melbourne and offers a service called Platform 1, in which passengers can register to get either an email or SMS to keep them updated on their train routes. Once a passenger registers their train route with Platform 1, they will receive a free SMS message if his or her train line has been disrupted or delayed. Emails are also sent out to these passengers up to one month in advance if scheduled maintenance is planned for stations that may affect their travel route. In addition, passengers can send an SMS costing fifty-five cents requesting either the next four trains departing from the nearest station, or for train information about any trip they want to take within Melbourne (Metro, 2009).

Connex Melbourne started to develop this SMS system with the help of Platypus Telecommunications about 10 years ago. The idea was to be able to notify their passengers of delays, disruptions, and cancellations on train routes. Connex provides all of their timetable

information, as well as any updates on train routes, to Platypus. When Connex sends an update about a train route change, Platypus searches its system and then sends an SMS notification to the appropriate passengers registered with Platform 1 (Platypus Telecommunications, 2009).

Platypus is a huge organization that not only runs this system for Metro, but handles other systems for organizations like the Australia Post and Citigroup. Platypus is able to set up systems like these in under three weeks with no limits on their database size or number of SMS messages that they can send out at once. Platypus states that they have sent out over 1 million messages in a day. Although large quantities of messages must be sent out in groups, the delay between them is only milliseconds and is therefore insignificant (Lamens, 2010).

One of the benefits to the Platypus system is that it can store information about each person in the database and then send out different SMS messages depending on what group they want to reach. Another ability of a Platypus system is that those listed in the database have the ability to request information provided by the organization for a small fee, similar to how Metro passengers are able to request incoming train times (Lamens, 2010).

Although this type of system already has many beneficial services, it continues to improve over the years. One potential improvement is that in the future text messages may be able to be sent out to phones based on where they are currently located and not where they are registered. The technology is already available to locate phones based on radio triangulation or Bluetooth, but there are still obstacles that need to be overcome if this feature was to be added. The team addresses these issues in Section 4.3.1 (Lamens, 2010).

Although the two systems described in this section are not used for emergency warnings, the team felt that the ability to send out and request information could be applied in emergency situations. For example, the ability of the system to store information about each person in the database and send out SMS messages to different groups of people could allow for specific messages to be sent out just to the hearing impaired or to just the hearing impaired in a particular location. Another possible application could be that emergency information could be updated to this system, and then people could send an SMS message to request updates for their area.

2.4 Current emergency systems around the world

This section focuses on countries other than Australia that have either advanced emergency communication systems or are particularly prone to bushfires. Since natural disasters

occur all over the world and there are many different strategies of handling them, broadening the research to other countries is a valuable tool in forming recommendations. This is a particularly relevant strategy, as a lot of work has been done recently on these systems due to large natural disasters such as the 2004 Indian Ocean Tsunami. By researching the legislation, current system, and accessibility for the Deaf and hard of hearing in these countries, stronger, better-informed recommendations can be made for the state of Victoria.

2.4.1 United Kingdom

The United Kingdom has gone through extensive efforts in recent years to ensure equal rights for disabled people. It started in 1948, with the Universal Declaration of Human Rights, which was a piece of legislation guaranteeing equal rights put out by the United Nations. At the European Convention on Human Rights in 1950 these rights were guaranteed specifically for people in European countries. However, since international laws can not mandate individual countries to follow them, it was not until the Human Rights Act of 1998 that court cases could be dealt with by the United Kingdom's own government (previously dealt with by the European Court of Human Rights). More recently, with the passage of the Disability Equality Duty in 2006, public organizations are required to pay "due regard" to how these rights were being upheld for disabled people (Disability Rights Commission, 2010). Since these rights include telecommunications as well as public services, an emergency warning system would fall under those rights. It is the responsibility of the Equality and Human Rights Commission to make sure that both the Human Rights Act and the Disability Equality Duty are enforced. All in all, these pieces of legislation and the Commission put a legal responsibility on organizations that put out emergency warnings to provide the Deaf and hard of hearing with the same notifications as hearing people (Equality and Human Rights Commission, 2010).

The current system for emergency management is outlined on the United Kingdom's "UK Resilience" website¹. The website is provided to give local officials information about the Integrated Emergency Management plan, which consists of six parts: anticipation, assessment, prevention, preparation, response, and recovery. The legislative document that describes this plan is called the Civil Contingencies Act and has two parts. The first part describes how it is the job of local officials to assess the emergency, put the emergency plan in action, and notify the

¹ <http://www.cabinetoffice.gov.uk/ukresilience.aspx>

public. These people are called Category 1 Responders and it is their job to effectively interact with Category 2 Responders. The latter are people in organizations that deal with secondary effects from the emergency, such as electrical or plumbing problems. Together, it is their job to mitigate the effects of the disaster in their area. Part Two of the Civil Contingencies Act outlines the emergency legislative powers the government can invoke if necessary. There are also two programs put in place to ensure the effectiveness of the Resilience framework. The Enhancement Program looks at what plans have been put into place by the Act and how these can be made better. The Capabilities Program checks to make sure all regions of the UK have a strong emergency response plan and are prepared in the event of a disaster (Cabinet Office, 2009).

The Capabilities Program is directed towards local and regional emergency responses and closely follows the framework of the Act. Instead of the national government in charge, responsibility is put on local responders to know what to do and to implement their planned course of action. As part of the program, there are twenty “work streams” that describe the various bases that the emergency responders should be covering. The first four deal with the structure of the system at the local, regional, and national levels. Six deal with essential services that must be provided during an emergency, such as food, water, and energy. The other ten deal with functional issues such as flooding or infectious diseases. One of these frameworks specifically deals with warning the public (Cabinet Office, 2009).

The first aspect of successfully warning the public is making sure everyone is knowledgeable about the procedure before an emergency ever happens. The most cost effective way to inform the public of emergency procedures is through the Internet, which is why the UK has extensive emergency information on both their government website² and the UK Resilience website. Once the emergency does happen, it will probably be the local government that issues the warning, although other organizations (such as from Category 2 Responders) could also raise the warning as long as it was organized with the government. In terms of the actual warning, Figure 3 shows some ways suggested by the UK government (HM Government, 2005).

2

<http://www.direct.gov.uk/en/Governmentcitizensandrights/Dealingwithemergencies/Preparingforemergencies/index.htm>

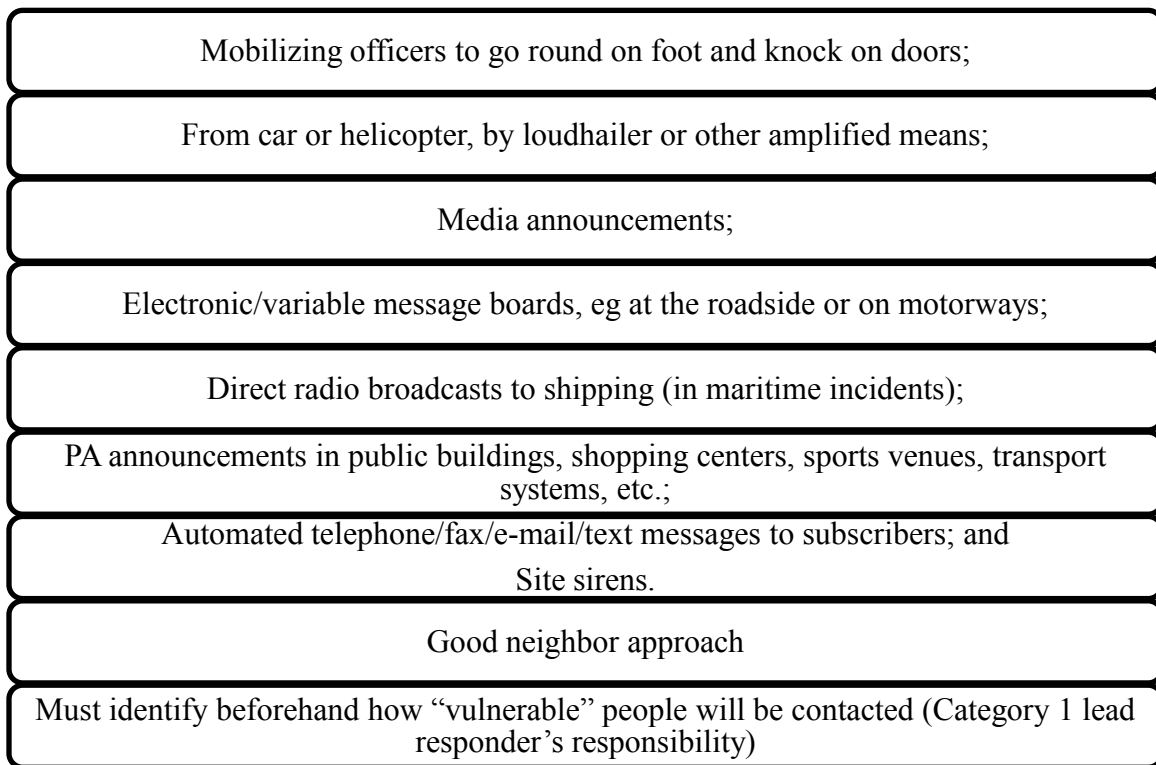


Figure 3: List of Possible Warning Methods in the UK

Putting this list on the Internet is representative of the government’s stance on emergency preparedness; the government will provide the framework and information, but it is the responsibility of the Category 1 Responders to successfully implement it. To ensure everything is working properly, there are practice tests of the system from time to time (HM Government, 2005).

With regard to the Deaf and hard of hearing, the services provided to them are very much reliant upon the region they live in. Since it is generally the local government that sends out the warning, they are the ones responsible under the Disability Equality Duty to make sure the Deaf and hard of hearing are notified. Looking at the list above, there are several methods that would be specifically effective for them. In keeping with the prepare-early mentality, all people that are especially vulnerable should be on record with the Category 1 Responders before an emergency happens. The “good neighbor approach” means that people living in close proximity to one another should take the initiative to help them in an emergency. This might mean going door to door like the police might do, or perhaps having a pre-planned procedure for making sure everyone in the area is warned and knows what to do. Other media approaches such as websites,

SMS messaging, and television can be also be used, provided the Deaf and hard of hearing are kept in mind during the development of those systems (for example providing subtitles). Overall, the outlook for emergency warning for the Deaf and hard of hearing in the United Kingdom is positive with the recent attention they are getting from the new legislation and emergency preparedness framework.

Gloucestershire is one example of a county that has adapted their resources to provide for the Deaf and hard of hearing. Their website³ provides general information, but has a section particularly relevant to safety and emergency procedures. As part of the provided resources, there are links to informational safety pamphlets. While there are text versions available, there are also videos in British Sign Language for any Deaf or hard of hearing persons that prefer signing. With the recent attention they are getting from the new legislation and emergency preparedness framework, the Deaf and hard of hearing are on their way to having the same access to emergency warnings as everyone else.

2.4.2 United States

With over 22 million Deaf and hard of hearing people, the United States has more members of this community than many countries have people (FEMA, 1999). As one of the most wealthy and technologically advanced countries in the world, the United States is also an important country to look to for advancements in the emergency warning systems.

With such a large number of auditory-impaired people, it is especially important to make sure the warning system is effective for everyone. Similar to the UK, the US was a member of the United Nations during the creation of the Universal Declaration of Human Rights. To add enforceability within the United States and, more specifically to the disabled population, the Americans with Disabilities Act was passed in 1990, and states that “no individual shall be discriminated against on the basis of disability in the full and equal enjoyment of the goods, services, facilities, privileges, advantages, or accommodations of any place of public accommodation” (Americans with Disabilities Act, 1990). This was a broad piece of legislation applying to various situations where the disabled might be discriminated against. In 2004, the much more specific Executive Order 13347 was issued “to ensure that the Federal Government appropriately supports safety and security for individuals with disabilities in situations involving

³ <http://www.gloucestershire.gov.uk/index.cfm?articleid=14971>

disasters” (Department of Homeland Security, 2005). As part of this Order, a council was formed to assess current systems, research new technology, and provide recommendations to the government on how best to provide the same level of warning to the disabled as everyone else.

In the council’s 2005 annual report, several steps had already been taken to improve the communications for the Deaf and hard of hearing. It was determined that any organization broadcasting video emergency alerts (such as on television) had to make the message accessible to the Deaf and hard of hearing, primarily by captions. The Federal Communications Commission (FCC) issued warnings in 2003 to California broadcasters that failed to provide accessible emergency alerts during wildfires. In terms of telephone communications, the council advised all Telecommunications Relay Service (TRS) providers to apply for priority access during emergencies. TRS is a technology that allows a Deaf or hard of hearing person to type a message to a relay center, which is then read to someone on the other end. The system works in reverse as well, so it is an important means of accessing information for the Deaf and hard of hearing during an emergency. The new plan will give these relay centers priority access to resources in terms of making the relay centers functional after an emergency or even during an emergency situation. Along those lines, emergency response personnel who help the Deaf and hard of hearing communicate, such as captioners and TRS workers are given priority in terms of getting transportation and telephone service. This allows them to do their job and effectively communicate to the Deaf and hard of hearing community, despite congested phone lines or traffic patterns. As a general theme to all aspects of the emergency warning system, the council is pushing for more inclusion of disabled people in the planning and testing of the system. This will help the FCC provide a more effective and useful system at all levels of emergency management (Department of Homeland Security, 2005).

On the national level for the general public, the FCC implements what is known as the Emergency Alert System (EAS). This notification system uses the numerous television, radio, and satellite communication networks already setup to deliver important emergency information. The broadcasting stations used to disseminate the messages are utilized by the president of the country or the director of the Federal Emergency Management Agency (FEMA). Since the source is the same for all these providers, there theoretically should not be issues of conflicting information being sent out from different sources. Working with the National Oceanic and Atmospheric Administration’s National Weather Service, the alert system is used to send out

emergency messages that pertain to the entire country (Public Safety and Homeland Security Bureau Services, 2010).

With an emerging technology called the Common Alerting Protocol (CAP), a single message could be sent out over multiple types of media to a specific geographic location. Of particular relevance to the Deaf and hard of hearing is the fact that the CAP does not just depend on audio messages, but can also handle images, maps, and videos. This would be helpful for them, since they could be sent an SMS message or shown a warning graphic on their mobile phone instead of receiving a phone call or having to watch television. The warning can also be translated into different languages, and since the warning is coded in Extensible Markup Language (XML), it can be read by almost all modern computers (Botterell, 2006). The CAP technology has not yet been fully implemented on a national scale, but tests are being done in Washington DC and many Federal agencies are implementing the technology (CAP Cookbook, 2010).

Another emerging technology beginning to come into play on the national and state levels is the Commercial Mobile Alert System (CMAS). With the proliferation of mobile phones in recent years, it makes sense to have an emergency system tied into these highly portable devices. One of the major drawbacks of the EAS is that it requires people to be watching television, listening to radio, or browsing the Internet. Mobile phone alerts have the potential to reach a much larger portion of the affected population. This system relies on commercial mobile service (CMS) providers volunteering to implement the technology, as well as specially equipped mobile phones. In 2008, all CMS providers had to state whether or not they were going to implement the technology (Public Safety and Homeland Security Bureau Services, 2010). However, since this is not a mandated service, it is clearly not a guaranteed right for everyone to have mobile phone alerts. The possibility of more widespread use of mobile phone alerts in the future is promising for the Deaf and hard of hearing, since mobile phone vibrating features can be effective at spreading the message.

While the EAS is controlled by federal-level government officials for national emergencies, state and local officials can use it for more localized emergencies. Except for large-scale emergencies such as threats to national security or tsunamis, most emergencies occur in geographically smaller areas. Issues such as extreme weather warnings can be sent out by the state, while child abduction alerts can be sent out to individual counties (Public Safety and

Homeland Security Bureau Services, 2010). This flexibility with the EAS allows quick notification to only those people likely to be impacted by the emergency.

At the more local level of towns, business, and schools, third party vendors can provide emergency warning services. In an interview with Janet Richardson, Vice President of Student Affairs at Worcester Polytechnic Institute (Appendix A), she described one such vendor named Connect-Ed. Connect-Ed originally started out broadcasting non-emergency messages to elementary schools and high schools, such as sport event cancellations and snow days. After the shootings at Virginia Polytechnic Institute and State University in 2007, there was a much higher demand for emergency warning systems on a more localized level. For example, Worcester Polytechnic Institute (WPI) in Massachusetts uses the Connect-Ed system to alert students and staff of situations ranging from robberies to class cancellations. This system can use texts, phone calls, and emails to send messages to the entire campus or specific groups of people. There is an annual fee of \$12,500 for the system. Not only is the system quick and efficient, but Richardson was pleased with the usability of the system in general. This system is also useful because users can register for warnings and receive test messages. This helps everyone be prepared before an emergency and know where to go for the most accurate up to date information during an emergency. In August of 2007, a town in Illinois used their system multiple times in one day to warn citizens of a car chase as well as flood warnings (Blackboard Connect, 2009). This system sends out alerts primarily through phone calls and/or SMS messages, which would allow Deaf and hard of hearing persons to be warned as well. The versatility, speed, and cost of these systems can make them extremely useful in small-scale emergency situations.

Overall, the recent legislation and advancement of technology shows how the government is paying more attention to how their system works for all citizens. Most television programs have the option to include captions and addresses to the public generally include a signing interpreter. The new proliferation in mobile phones and Common Alerting Protocol suggests that in the near future, emergency SMS messages could be sent to all Deaf and hard of hearing people. However, not all countries are as far along in this process as the US and UK.

2.4.3 Canada

The Canadian system is not quite as technologically advanced as the UK or US systems; however, the emergency warning system in Canada provides a useful model for Australia. Like

the Australian government, the Canadian government is currently trying to improve the system, but is running into legislation and implementation issues.

In terms of legislation guaranteeing the rights of disabled people, a national Canadians with Disabilities Act has been proposed and discussed for a few years, but has yet to be implemented (Canadians with Disabilities Act, 2005). In a speech given in 2007, Prime Minister Harper stated that he would move forward with the Act, but that has yet to happen (Harper, 2007). The most promising legislation comes out of Ontario, where there is the Accessibility for Ontarians with Disabilities Act of 2005. However, this document deals more with the right of disabled people to get in and out of public buildings and have the same opportunity for public transportation than it does with communications.

In terms of implementing an emergency warning system, Canada began running into difficulties following the Cold War. The Nuclear Attack Warning Siren (NAWS) system in place during the war fell into disrepair in the early 1990s. However, following the tsunamis in the Indian Ocean in 2004 and the terrorist attacks on September 11, 2001, there was a renewed interest in emergency warning systems in Canada (Gow, 2007).

This renewed interest has led to the current system in Canada, which is largely focused on emergency response at the local level. When there is an emergency, the police, fire department, and medical services respond. When the disaster is more widespread or severe than these groups can handle, the territories get involved. For very large scale emergencies, the federal government will step in to provide support. Public Safety Canada is the branch of the Canadian government responsible for organizing and providing support for local, territorial, and national emergencies. They serve as the communication link between the various levels of response, and can also provide financial support for situations that exceed the ability of the local authorities to deal with (Public Safety Canada, 2009).

The telecommunications during an emergency situation are handled by a department of the Canadian government called Industry Canada. They provide the actual warnings and the information about the appropriate response. It was not until 2000 that the need for a better public warning system was recognized. By the mid 2000s, the CAP, already in use in the United States, was identified as a top contender for the best method of moving forward.

The CAP uses a standard code for sending messages (Allport, Buck, & Diver, 2009). With the CAP, officials at any level of the government can send out warnings to the specific

population affected by the disaster. This could range from local communities to continental populations. The fact that the US is looking to use the same system has led to discussion of a possible North American emergency warning system in the future. However, if implemented, these warnings could be sent to mobile phones, radios, Internet, televisions, and other media simultaneously and with the same message across the continent (Skora, 2006).

Despite the hope of more advanced technologies and the desire to help the disabled, there are still many problems to overcome before an effective system is implemented. Like all government programming, funding is a major issue. Getting the system up and running will take money, as will sending the actual messages over the media lines. These media lines bring up other problems, such as which television or radio stations will show the warning and in what form. It is not an easy task, regulating all the different media providers whose resources will be tapped into for this system, and it is not always clear which providers will be used. A common problem in emergency situations is figuring out which information to trust from the many different sources. When there is an abundance of media sources providing information about the emergency and they are all slightly different, it can confuse the public rather than inform them. There needs to be some institution that filters and regulates the dissemination of information during these times, but there is no current framework for that in Canada. CANALERT was the name of a program that was worked on for a few years to restructure the warning system. However, the program remains a conceptual design due to a lack of funding and there are still many issues that need to be addressed before Canada has an up-and-running emergency communication system (Gow, 2007).

Since the current system in Canada is not very advanced in general, the Deaf and hard of hearing are at an even larger disadvantage. Although some preliminary legislation is in place and there are ideas for improvement, there are not any guaranteed rights for the Deaf and hard of hearing. The CAP technology that includes mobile phones and subtitles exists, but it has run into governmental road blocks. However, these road blocks could provide a useful model for Australia in terms of what issues they might expect in trying to modify their emergency warning system.

2.4.4 South Africa

As of 1981, South Africa has been undergoing a Disability Rights Movement (Jagoe, 1992). This movement started after the United Nations declared 1981 to be the International Year of Disabled Persons. The South African Government chose not to recognize this declaration, and as such, groups were formed to protest for the rights of disabled citizens. Since these protests have started, several organizations were formed, including Disabled People South Africa and the Deaf Federation of South Africa (DeafSA). South Africa now also follows the United Nations Universal Declaration, declaring many natural rights of all humans (United Nations, 1948).

Article 19 of the Declaration states “Everyone has the right to...receive...information and ideas through any media regardless of frontiers” (United Nations, 1942). South Africa has developed several means of relaying information to the Deaf and hard of hearing. Deaf Television is a television program in which all broadcasts are in South African Sign Language (SASL; New Production Company, 1996). It provides many types of television broadcasts, for entertainment and information, including both national and international news. The news programs are used to convey important information to Deaf and hard of hearing citizens, and can be used to transmit emergency information. Furthermore, all broadcasts can be interrupted with important emergency information.

The DeafSA website is also used to relay important information to the Deaf and hard of hearing community. Important information is on the DeafSA’s homepage for easy access. Mostly, the information is just text; however, sometimes information appears as videos in SASL.

2.4.5 Spain

The emergency communication system to alert the citizens of bushfire-prone Spain is very underdeveloped. Spain participates in the European Union (EU) emergency phone number program where it is free of charge to call 112 from a mobile or fixed phone to reach police, fire brigade or medical services anywhere in the EU. This program is helping to unify the EU, but people with disabilities are still left out. A program called REACH112 is working to extend this service to the disabled. They provide better means of communication by using Total Conversation, which is a concept that uses video chat and also adds real time text. This allows the Deaf and hard of hearing community to sign, lip-read, or type when communicating directly

with emergency services. They can also use the National Relay Service, which allows people to either speak or type to an operator who then speaks or types to the person on the other end of the call. If this approach is used, the operator would be calling 112 directly to relay the emergency message (REACH112, 2010). REACH112 is helping Deaf and hard of hearing people communicate during emergencies but it is a trial program that ends June 3, 2012. Also, there is no reverse REACH112 program in place, which would send out an emergency alert to people giving information about how to respond to a particular emergency. (Petiti, 2009)

2.4.6 Greece

Greece, a bushfire-prone country, also participates in the EU emergency phone number program. Greece's Information Society Open to Impairments (ISOTIS) is an organization that strives for equality by helping the disabled and the elderly overcome barriers so that they are able to access the same technologies and services as the rest of the community. ISOTIS is also a partner with the REACH112 consortium that works to benefit people with special needs and helps those, like the Deaf and hard of hearing, access emergency information (e-ISOTIS, 2010).

Also accessible to the Deaf and hard of hearing, Greece's General Secretariat for Civil Protection's (GSCP) webpage offers information on how to deal with different types of hazards such as forest fires, floods, and earthquakes. It also provides emergency contact information and a "Forest Fire Danger Daily Forecast" (General Secretariat for Civil Protection, 2010). In addition, the GSCP has a network of volunteer emergency responders called Volunteers Emergency Alert. The volunteers are sent an SMS message informing them of the location and type of emergency so they can work in collaboration with the Coast Guard, Fire Department and any other emergency agency to assist those in need (The Department of Citizen Relations Management, 2009).

2.4.7 Worldwide

Internationally, an early warning system is being developed to help prevent natural disasters from claiming lives. The United Nations Environment Programme (UNEP) addresses environmental concerns globally and focuses both on science and government when making policies and decisions. They assess environmental trends and then develop legal policies. One of their focuses is on early warning systems and the assessment of natural disasters. They provide countries with environmental information and recommendations on how to proceed (United

Nations Environment Programme: Organization Profile). In reaction to recent natural disasters, such as the Indian Ocean Tsunami in 2004 and Hurricane Katrina in 2005, the United Nations has proposed an addition to UNEP, the Global Environmental Alert Service (GEAS). The purpose of the GEAS is to help decision makers and the general public understand the complicated scientific data and observations by compiling all the information into a simpler format that is located online.

GEAS would provide warnings of global events, such as tsunamis, earthquakes, fires, and cyclones, to nations at risk. The system would be built on the nations' systems already in place and would be coordinated to communicate these emergencies. The emergency information would initially come from sources like the Common Alerting Protocol in the United States. GEAS would collect information from all its sources and create a centralized database of warnings. GEAS would then send out these emergency warnings in the form of emails, SMS messages, and through the Internet with real-time mapping. The website would be updated regularly and people would be able to observe changes in their environment as they happen. (Grasso, 2007) As countries receive the alerts from GEAS, they will be able to respond accordingly. With international communication, natural disasters will hopefully take fewer lives.

2.5 Vicdeaf

The Victorian Deaf Society (Vicdeaf), founded in 1884, is the main source of guidance for Deaf and hard of hearing adults in Victoria. Vicdeaf works closely with other public service agencies, including those for health, employment, government, and welfare (Vicdeaf, 2010). While the 2006 Australian Census reports that Victoria has 2,172 sign language users, Vicdeaf works to service these and others for a total of over 16,000 Deaf and hard of hearing people every year (ABS, 2007, Vicdeaf, 2010). However, it is difficult to verify the accuracy of such numbers because there are many different levels of Deaf and hard of hearing. Also, sign language is not always used.

Vicdeaf's main goal is to improve the quality of life for the Deaf and hard of hearing. They have three main objectives to accomplish this goal. First, they desire to overcome all communication barriers and, in doing so, to make services for the Deaf and hard of hearing more easily accessible. Second, they want to have the Deaf and hard of hearing community participate

more actively in society. Finally, they wish to make it easier for the Deaf and hard of hearing community to find specific support and services (Vicdeaf, 2010).

We worked closely with Vicdeaf primarily pertaining to their first goal of overcoming communication barriers. They have identified that the Deaf and hard of hearing community is not effectively notified of emergencies, especially of bushfires. The current emergency communication system comprises many forms of communication that are used to send out warnings to reach as many people as possible, but this system has not been tested for the Deaf and hard of hearing community. Vicdeaf has recently worked to help their community by sending e-newsflashes to all who are on their mailing list. These newsflashes contain information about preparing for bushfire season, warnings of current fires, and the recovery process after a fire.

Prior to this project, the opinions of the Deaf and hard of hearing community regarding specific warning systems were unknown, as was the willingness of the population to use the new systems. Understanding the perspectives of this community was critical to make recommendations to improve the system for the Deaf and hard of hearing. This improved system could potentially help the general population as well, if it has the capabilities to reach large numbers of people in a simple, cost-effective way.

CHAPTER 3: METHODOLOGY

The goal of this project was to help the Deaf and hard of hearing population of Victoria, Australia to be better informed during a state of emergency. The project first established a deeper awareness of international practices by investigating how other emergency communication systems around the world fulfilled the needs of the Deaf and hard of hearing. Next, it evaluated Victoria's current system to identify improvements that could be made to the system's ability to convey emergency information to the Deaf and hard of hearing. Then, it investigated potential challenges that could arise with implementing new changes to the emergency communication system. The data collected were analyzed and recommendations were proposed to the Victorian Deaf Society. This chapter explains how the team accomplished the following objectives:

1. Compare warning methods of the current emergency communication systems in foreign countries.
2. Evaluate the Victorian Deaf and hard of hearing community's level of satisfaction with the emergency communication system and identify particular aspects of the system that they find either especially helpful or challenging.
3. Investigate potential challenges to implementing changes to the emergency communication system in Victoria.
4. Propose recommendations for the current system based on examination of other countries' and Victoria's systems that will improve upon the current system and increase its effectiveness.

The project took place between March 11, 2010 and May 4, 2010. Although the system we evaluated was for the entire state of Victoria, we conducted most of our methods in the city of Melbourne, Australia. Some studies were done in the more regional Victoria since these are the areas more affected by bushfires (40-50 km outside Melbourne). An overview of the project is shown below in Figure 4: Project overview.

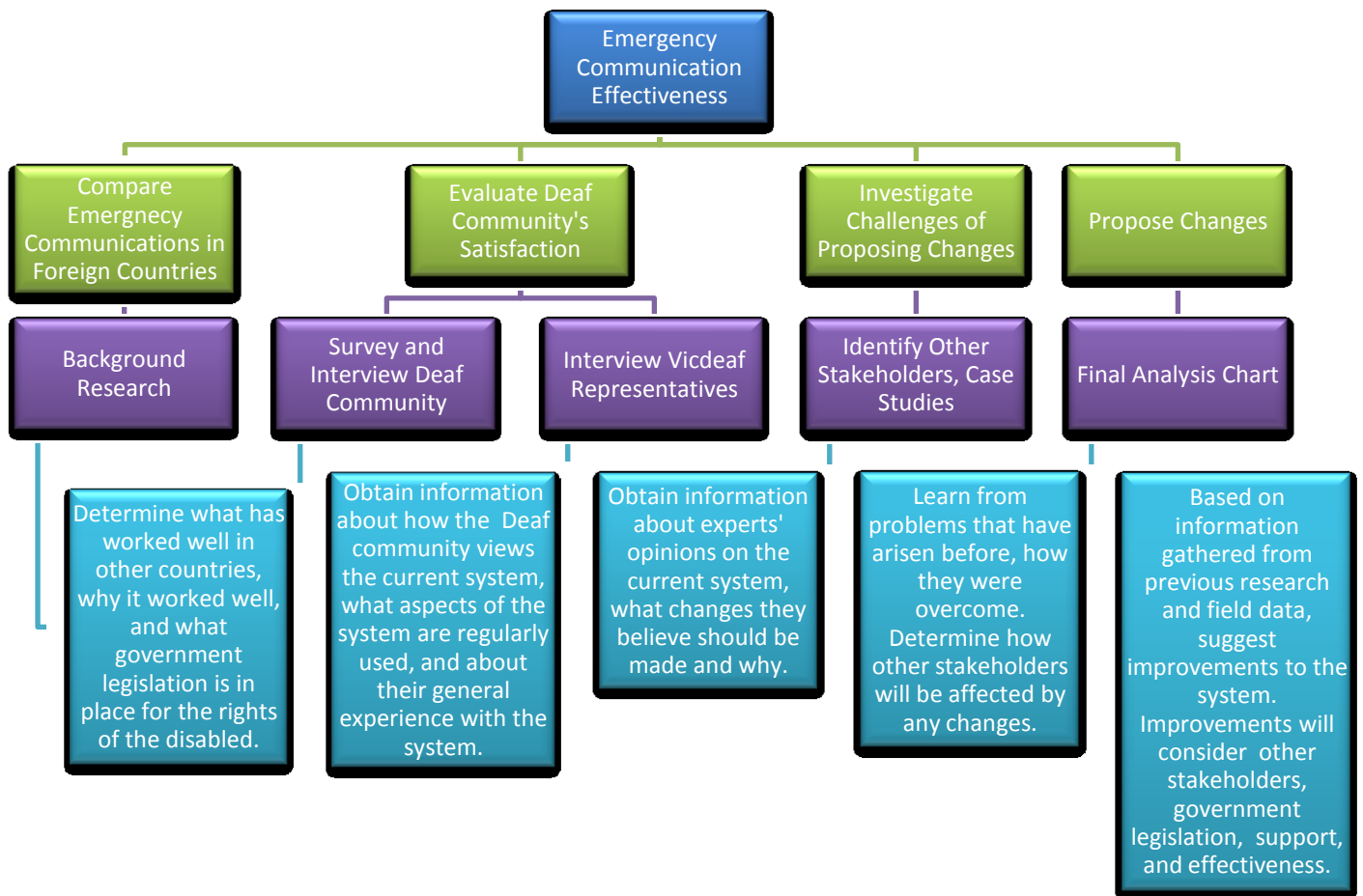


Figure 4: Project overview

3.1 Comparison of foreign countries' emergency communication systems

In order to identify common themes among the foreign countries, we did a comparison between the different emergency communication systems. This comparison took into account three aspects of emergency communications systems: the governing legislation, the actual system, and the accessibility of the system for the Deaf and hard of hearing. Since the

information for this methodology was from the background research, it did not involve any complex procedures or contact of external parties. The complexity and usefulness came from analyzing the background information from the foreign countries to identify common trends.

3.2 The Deaf and hard of hearing community's level of satisfaction with the current warning system

Before suggesting improvements for Victoria's emergency communication system, it was essential to evaluate the Deaf and hard of hearing community's level of satisfaction with the current system and identify areas that they felt could use improvement. We evaluated the level of satisfaction in two ways. The first was by administering a survey with the goal of obtaining data that illustrated the general views of the entire Australian Deaf and hard of hearing population. The second was by conducting interviews to gain a more personal testimonial from Deaf or hard of hearing individuals about their specific experiences and opinions with the current system. As a control, the team researched the general population's views of the system, and compared those views with that of the Deaf and hard of hearing community.

3.2.1 Survey

The point of the survey was to provide a big-picture summary of the Deaf and hard of hearing's opinion on the current emergency warning system. Since they are the primary stakeholder, it was essential to get their input on which system would be most effective for them and which areas needed improvement in the current system. Although the project was done specifically for Victoria, the survey was open to all Deaf and hard of hearing people in Australia. This was done to increase the number of respondents, but also to find out if an effective system was being used somewhere else that could be applied to Victoria.

We categorized the survey questions into four parts that provided information on both the warnings that had been used in the past and on those warnings that should be used in the future. The first section asked about personal demographics, such as age, location, and level of hearing. This was done to ensure that we had a large range of respondents. The next section asked about personal experiences with emergency warnings, so that the system used in the past could be characterized. The third section focused on television, websites, and SMS warning systems to try and figure out what method of emergency communications would be best to improve in the

future. The last section asked for an overall opinion of the system and provided an opportunity for the person to give written feedback on what they would like to see out of an emergency warning system. Appendix H provides a text version of the survey.

In order to reach the largest number of people, the survey was active on the Vicdeaf website from March 25, 2010 to April 19, 2010 (see Appendix K). The questions were provided in both English text and Auslan videos to facilitate the Deaf and hard of hearing's ability to respond to the survey. As a method of increasing the number of responses, the team sent emails to relevant Deaf and hard of hearing organizations, societies, clubs, and service providers asking them to advertise the survey on their website, Facebook page, newsletter, or any other means these organizations have available. The team made and distributed flyers (Appendix I) to the organizations that were willing to help, as well as the Vicdeaf office.

We analyzed the results by entering the data into a Microsoft Excel sheet. Separate sheets were made for Victorian responses and non-Victorian responses. From these sheets, the team graphed and analyzed the information.

3.2.2 Interviews

The team conducted interviews with Deaf and hard of hearing people to gain a more personalized, detailed account of their experience and opinion of the emergency warning system. Face-to-face interactions in small groups is often a better and more effective way of communicating with the Deaf and hard of hearing than an impersonal survey. The personal setting allows the interviewee to open up and perhaps trust the interviewer more, providing a greater detailed account (Ryan, 2005). The team also wanted to be sure that literacy or technological issues did not prevent us from talking to a wide range of the population, such as the elderly who may not be online enough to notice the survey.

In order to propose changes to Victoria's emergency alert system, we first characterized the current system and researched whether and to what extent recent changes have benefitted the Deaf and hard of hearing community. To understand these changes we conducted face-to-face, in-depth, qualitative interviews with two Deaf members of the Victorian Deaf Society: David Peters and Michael Parremore. David Peters works specifically with projects related to emergency communications and Michael Parremore works with the communications department. We asked these interviewees how the new system works, what major communication

technologies are used, and what controversies have arisen regarding this system. We asked for their opinions of the new system as well as what they would like to see changed. We also asked them if they have any information about the Deaf and hard of hearing community's opinions and if they are aware of any complaints or positive feedback. By interviewing these experts, we were able to make informed decisions when proposing changes in the emergency communication system.

The interview questions for the rest of the Deaf and hard of hearing community were modeled from the survey questions to a large degree. However, the interviews focused primarily on any personal experiences with the warning system. This was the major advantage of conducting interviews versus surveys, because the interviewees were able to provide a much more detailed account of their experiences, and even recount a relevant experience of a friend or family member. The questions were then directed towards determining the best media for receiving a warning, such as via SMS, television, or website. Finally, they were asked for any suggestions or improvements because they have the greatest knowledge on effective means of communication for their community.

Several methods were used to find interviewees. About half of Vicdeaf's employees are Deaf or hard of hearing, so they were the easiest to contact. A club for elderly Deaf and hard of hearing people meets at Vicdeaf fortnightly, so they were another population we sampled. To broaden the scope, the team travelled to Casey Deaf club for one of their meetings to conduct more interviews. Finally, the last question of the survey asked if the respondent would be willing to be interviewed, so those willing made up the last population of interviewees. Due to the limited ability to contact members of the Deaf and hard of hearing community, lack of self-transportation, and time constraints, the groups sample are not representative of the entire demographic of the Deaf and hard of hearing community. However, the team did try to cover major demographics when possible, such as selecting both young adults and the elderly. A total of 24 people were interviewed.

Conducting interviews with the Deaf and hard of hearing community requires more consideration to logistics than interviews between two hearing persons (RIT National Technical Institute for the Deaf, 2010). First, the team made sure there was at least one interpreter present, but preferred two if the interview was going to last more than an hour. When possible, the interpreter was shown the interview questions beforehand and made sure they were clear on what

was being asked. The interviews were conducted in rooms that had ample lighting. During the interview, the interpreter sat next to the interviewer and across from the Deaf/hard of hearing person. This allowed everyone to see or hear everyone present. All questions and comments from the interviewer were directed at the Deaf/hard of hearing interviewee and not the interpreter. Also, the interviewer always made eye contact with the interviewee. In each interview, there were two team members, one interpreter, and the interviewee. The interview was recorded on a laptop microphone, and minutes were taken electronically by one of the members on the team. The other member asked the questions. The recording and the minutes were then used to go back and analyze the content of the interviews for information, common themes, and suggestions.

3.3 Investigate potential challenges to implementation of changes

To make informed and useful recommendations, it is important to understand the challenges that could arise that would potentially hinder the implementation of these recommendations. Providing Vicdeaf with this information will help them prepare for the challenges that are likely to arise with implementing the team's recommendations. To learn more about these challenges, the team contacted other stakeholders, conducted case studies on prior Vicdeaf projects (dealing with fire alarm subsidy and video relay interpreting), and on the implementation challenges of the US system. This section outlines how the team identified and investigated potential challenges.

3.3.1 Stakeholders other than the Deaf and hard of hearing

As in any complex problem involving potentially competing interests, before any changes can be recommended or implemented, it is first important to understand the viewpoints of stakeholders other than the targeted group. For this project, the other major stakeholders that the team identified were the companies and organizations responsible for sending out emergency warnings, the Victorian government, and the hearing population. To identify the pertinent companies and organizations, we conducted preliminary research to decide which methods of emergency communication were specifically important for the Deaf and hard of hearing. These included television, websites and SMS messaging. To learn more about each of these areas and possible implementation challenges, the team tried to contact via email, telephone, or personal interview the ABC television station, Platypus, Telstra, the MFB, the Department of Justice, and the CFA. ABC was contacted to inquire about the details of closed captioning, while Platypus

was contacted with questions about the SMS warning messages they send out about Melbourne tram schedules. Unsuccessful attempts were made to contact Telstra about their role in telephone warnings. To understand how warnings are sent out and to ask questions about current emergency preparedness programs, the team spoke with the MFB and CFA. The team met with the Department of Justice's Office of Emergency Services Commissioner for the government's perspective on our recommendations. A brief discussion of the hearing population's perspective is provided in Section 4.2.4.

3.3.2 Fire Alarm Subsidy case study

In order to identify potential obstacles in implementing our recommendations for the Deaf community, it was helpful to examine the obstacles facing another recent project in Victoria, the Fire Alarm Subsidy. In addition to researching the scheme on the web, the team read the "Review of the Fire Alarm Subsidy Scheme for the Deaf and hard of hearing Victorians" which was written in 2009. The team also interviewed Louisa Willoughby, a Vicdeaf employee and author of the review.

3.3.3 Video Relay Interpreting case study

To further identify potential obstacles, the team looked into another project: the "Video Relay Interpreting Services in Victoria" Interactive Qualifying Project that was completed in 2008 by another project team from WPI. In addition, our team interviewed Marc Curtis, the manager of Sign Language Communications Victoria, which is a branch of Vicdeaf. Curtis was also one of the original two people who worked to get the Video Relay Interpreting (VRI) service implemented.

3.3.4 United States emergency warning system case study

By examining the implementation of warning systems in other countries, we sought to identify potential challenges and obstacles to any of our proposed changes. As a country that has recently undergone numerous changes to their system, the United States was chosen to provide this information. The case study on the US was done primarily by researching reports. Despite multiple attempts, the team was unable to make contact with the National Association of the Deaf in the United States. However, since the changes made have been fairly recent and were

well-documented, extensive amounts of information were available in the absence of personal communications.

3.4 Propose changes to the current system

Compiling and analyzing the collected data from the research, interviews, and surveys required a structured and informative methodology. Therefore, our approach was to provide a list of recommendations, state which organization should implement them, and when applicable, provide guidance on how to overcome anticipated barriers with their implementation.

The team generated the list of recommendations from a variety of places. It came primarily from research on the US case study, since the team found numerous reports that provided extensive and relevant recommendations in an organized form. Out of these recommendations, the team chose those that applied to the Australian system, had applicability to the Deaf and hard of hearing, and were supported by the interview and survey results. The reasons for each recommendation were provided along with the actual recommendation.

Determining which organization was responsible for following through with the recommendations was a challenge for the team. Although all of the recommendations were made to Vicdeaf, we tried to identify the other major organizations that would need to be collaborated with. The team used the Emergency Management Manual of Victoria as a reference. Some of these organizations were obvious due to the nature of the recommendation, but for others, the team tried to identify and in some cases contact the most relevant ones. The organizations contacted are the “other stakeholders” listed in Section 3.3.1.

The implementation challenges identified in Objective 3 were also summarized and provided alongside the recommendations.

CHAPTER 4: RESULTS AND ANALYSIS

This chapter provides an analysis of emergency warning systems and rights of the Deaf and hard of hearing in other countries (Objective 1), the results and analysis for the survey and interviews (Objective 2), and the results and analysis of the team's study on potential challenges (Objective 3). The analysis of the foreign countries provides information about which systems work well in those countries and why. The survey and interviews provide additional insight into what is an appropriate and effective system to implement in Australia. The early identification of challenges can help make the implementation more successful. Accomplishing these objectives provided the team necessary information to make recommendations on what needs improvement to increase the effectiveness of emergency warnings in Victoria for the Deaf and hard of hearing (Objective 4, Chapter 5).

4.1 Comparison of emergency communication systems in foreign countries

Before any changes or improvements could be recommended, it was necessary to gain an in-depth knowledge of the current emergency warning system in Victoria. Alone, this would be too narrow a view, because it would be hard to know how Victoria compares to the rest of Australia and the rest of the world. By researching other countries, the team was able to identify themes and aspects of foreign systems that made them particularly effective for the Deaf and hard of hearing. For example, new technologies and effective legislation could provide a model on which to base a more comprehensive system for Victoria. Therefore, the team conducted background research on not only the other states and territories in Australia, but also the United Kingdom, United States, Canada, South Africa, Spain, Greece, and the World (Section 2.4). The analysis of this background research is compiled below in three categories, focusing on disability legislation, structure of the system, and accessibility for the Deaf and hard of hearing.

4.1.1 Disability rights and laws

Understanding the legal responsibilities of a country to provide emergency warnings to the disabled is very important when trying to implement changes. Since it is often difficult to initiate changes, it is necessary to consider whether those changes can be legally mandated. This section describes such legislation currently in force for the various countries researched.

Both the United Kingdom and the United States have strong legislation in place to protect the rights of its Deaf and hard of hearing population. In the United Kingdom, the Human Rights Act is the primary document guaranteeing equal rights for everyone, while the Disability Equality Duty further emphasizes those rights (Disability Rights Commission, 2010). The Equality and Human Rights Commission makes sure that those rights are upheld in practice (Equality and Human Rights Commission, 2010). In the United States, the Americans with Disabilities Act guarantees the equal rights for people with disabilities, with additional support coming from Executive Order 13347 (Department of Homeland Security, 2005). A council formed as part of Executive Order 13347 ensures all disabled people have access to emergency alerts. The team concluded that the legislation in these countries is particularly strong because it is specific and is reinforced by government bodies. The legislation specifically outlines the equal rights for disabled people in emergency situations. This is important because if they were general statements, they could be construed as not applicable under certain circumstances. Also, the fact that both countries have either a commission or a council responsible for making sure these rights are upheld is crucial in making sure they are enforced. It also provides the public with an organization to speak with if they feel they are being mistreated or have ideas on how to make the system better.

With regard to Canada, South Africa, Spain, and Greece, the team did not find any legislation that specifically dealt with the rights of the disabled in emergency situations. Canada has a proposal for more complete disability legislation, but it has not been ratified yet (Canadians with Disabilities Act, 2005). South Africa has a growing Disability Rights Movement and some organizations have been put in place to advocate for the rights of the Deaf, but no specific legislation (Jago, 1992). Neither Spain nor Greece had information publically available on any relevant legislation, and although the United Nations can put forth legislation about equal human rights, they do not have the power to enforce those rights within a specific country.

As will be shown in the next two sections, how comprehensive and developed a system is for the disabled often directly relates to the strength of the legal documentation describing rights of the disabled. The team infers this is because the presence of strong legislation both mandates that equal rights be enforced and raises general awareness of the issue. This comparison between systems' comprehensiveness is provided in the next section.

4.1.2 Structure of emergency warning systems

In the midst of a chaotic emergency situation, it is vital to have a clearly-defined and well-organized system in place. Effective emergency response often depends on making sure the public is well prepared for an emergency, the responders are clear on their responsibilities, and the warning technology is effective. This section examines these three aspects of the emergency warning system in the researched countries. Greater emphasis is placed on the UK and US because their systems are the most developed and have the most information available. The other countries are mentioned when their system differs in some aspect or is particularly relevant to Australia's system.

The team found that the systems in the United Kingdom and United States have the clearest explanation of the preparation phase of an emergency. For both countries, the preparation phase depends on a well-designed website that provides helpful information about preparing for emergencies. The Civil Contingencies Secretariat's "UK Resilience" website⁴ and the general UK government website⁵ not only provide the public with information on how best to prepare for an emergency, but also outline who is responsible for each aspect of the emergency preparation and response (HM Government, 2010; Cabinet Office, 2009). In fact, the actual legislation outlining the whole procedure, known as the Civil Contingencies Act, is readily found on the UK Resilience website. For the US, the website for the Federal Emergency Management Agency⁶ (FEMA) provides details on the preparations and actions that should be taken for a variety of different emergency situations.

It is also clear that in both of these countries, as well as in Canada, where the responsibility lies in terms of responding to an emergency. The team identified a common theme in these countries with regard to the hierarchy of responsibility, mainly that the response goes from the most local level to the national level. Descriptions of the national alert systems often emphasized how the federal system is in place for large-scale disasters, but smaller-scale emergencies should first try to be dealt with by resources at the local or regional level. For example, in the UK, it is up to the emergency workers (e.g. policemen and firefighters) in each town to understand the emergency response procedure. Their managers are in charge of

⁴ <http://www.cabinetoffice.gov.uk/ukresilience.aspx>

⁵ <http://www.direct.gov.uk/en/Governmentcitizensandrights/Dealingwithemergencies/index.htm>

⁶ <http://www.fema.gov/>

dispatching the necessary resources and, when necessary, contacting the next higher branch of government to help. These emergency plans are put in place, taught to the relevant parties, and practiced to ensure effectiveness (Cabinet Office, 2009). Government websites in all three countries provide useful information for responders on how to set up the emergency plans and system. Many of the researched countries also have extensive information for the public on what to do in an emergency.

In terms of the actual technologies used for warnings in the US and UK, the team believes that SMS is the most promising in terms of alerting individuals on national and local scales. The strength in the SMS system lies in its specificity and versatility. Specific individuals can be contacted based on demographic information or geographic location. Depending on the system, individuals can register with the government or service provider so that they will automatically receive warnings and updates on their mobile phone. The geographic population that gets the message and when it is sent can be controlled for different scales or types of emergencies. This lends great versatility to the system as well. However, as the newest technology, it is not as widely implemented as some of the others. The other media that are widely used are radio, television, and websites. These can also be used to reach a specific geographic population, but are less specific than SMS. Since the warnings are broadcast to the public at large, only those individuals who are currently engaging that media are warned to the emergency. There is no guarantee that any given individual will receive the warning.

One interesting “technology” used to warn people in Greece is the volunteer emergency responders who work with the typical emergency agencies (e.g. police, coast guard, fire department) to help those in need. After the volunteers register, they will receive a text when there is an emergency situation in their area that they need to respond to (The Department of Citizen Relations Management, 2009). Having this spread out population of volunteers allows knowledgeable responders to be on the scene quickly, regardless of the location of the emergency. This is similar to a suggestion from the UK for people to use the “good neighbor” approach, which involves a citizen making sure everyone else in the neighborhood is also aware of the warning. One last method suggested by the UK government is for towns to have warnings on electronic boards, such as those on the sides of major roadways (HM Government, 2005). The problem with this is that only those people driving by the sign would have access to the information. In terms of unifying all these different technologies, the team believes that the

Common Alerting Protocol used in the US is the most promising system. Using the special CAP format, a single message can be written and sent across many different technologies. Canada has looked into using this technology and it has been involved in discussions for a worldwide system. It appears to be the direction emergency warning systems are headed, but issues such as cost and implementation are preventing it from being widely used.

The next section shows how, in general, the more advanced and organized a system is for the public, the more effective it is for the Deaf and hard of hearing. Since the Deaf and hard of hearing are a minority group, most of the systems just described were not designed specifically with them in mind. However, certain aspects of the systems can still work well for them.

4.1.3 Accessibility for the Deaf and hard of hearing

Ideally, one or more of the methods of warning the general public of an emergency will also work for the Deaf and hard of hearing community. In general, the more methods a system has of warning the public, the greater the chance one of them will work for a Deaf or hard of hearing person. However, just relying on this chance is not enough, so it is important to consider and analyze how effective these means actually are at warning the Deaf and hard of hearing community.

There are many adaptations to the systems that are common throughout most of the countries that we researched. For example, an emergency telephone number is often available for Deaf or hard of hearing persons to type a message or receive a typed message on their TTY. Certain websites are also equipped with videos of people signing the information on the page, for those that are not very literate in the native language or prefer to view signing instead of reading text. For the more advanced systems and countries with a large Deaf population, captions on television broadcasts are fairly standard. This is true especially in emergency situations where there might be a scrolling text feed describing the situation.

Although these adaptations are useful, they still rely on the individual using the media at the time the warning is sent. Since Deaf and hard of hearing people often have difficulty receiving communications from the general public, more proactive approaches can be beneficial. For example, with third party SMS systems in the US, specific registered users can be targeted to receive a certain SMS. This means that the Deaf and hard of hearing population could receive a specialized warning if need be. This system is not implemented in any country on the national

scale, however. The UK and Greece have another useful method for warning specialized populations in the “good neighbor approach” and volunteer program. By knowing who in the community might need extra help receiving a warning, emergency responders and community members can make sure they are properly alerted.

In summary, there are systems around the world that help the Deaf and hard of hearing receive emergency warnings. The countries that have strong legislation requiring equal emergency communications for disabled people tend to have more developed warning systems. This starts with a well-designed website so the public and emergency responders know what to do and who is responsible during an emergency. Since countries with strong disability laws take into account the need to warn a wider range of people, these systems tend to have more ways of warning the public. This increases the chances of a Deaf or hard of hearing person being warned, rather than relying on one type of media.

4.2 Deaf and hard of hearing community’s views on emergency communications

In this section, we analyze the survey and interviews responses conducted by the team. We use this data to determine the Deaf and hard of hearing community’s level of satisfaction with Victoria’s emergency communication system, what problems the Deaf and hard of hearing community has with the system, and any improvements the community would like to see with the system.

4.2.1 Surveys

We received a total of 50 responses to our survey from Victorians. The demographics of the respondents are shown in Figures 5 through 7. Although the demographics did not have an effect on the analysis of the surveys, the team wanted to ensure that the surveys were completed by a wide range of people. The survey was open to every state of Australia, but only 18 non-Victorian responses were received. Since these were divided among all the other states, the team felt that there were too few responses to be able to make conclusions about those states.

From these responses, we can gather information on several topics – how well the different methods of emergency communication are utilized, the Deaf and hard of hearing community’s opinion of the communication system, their preferred methods of communication, and how well the Deaf and hard of hearing community is educated about the system.

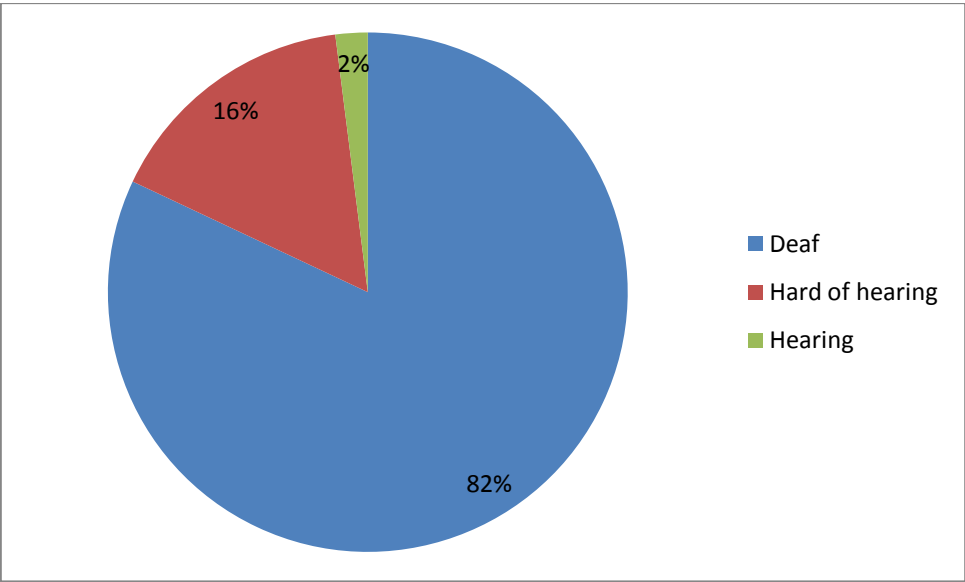


Figure 5: Hearing level of respondents

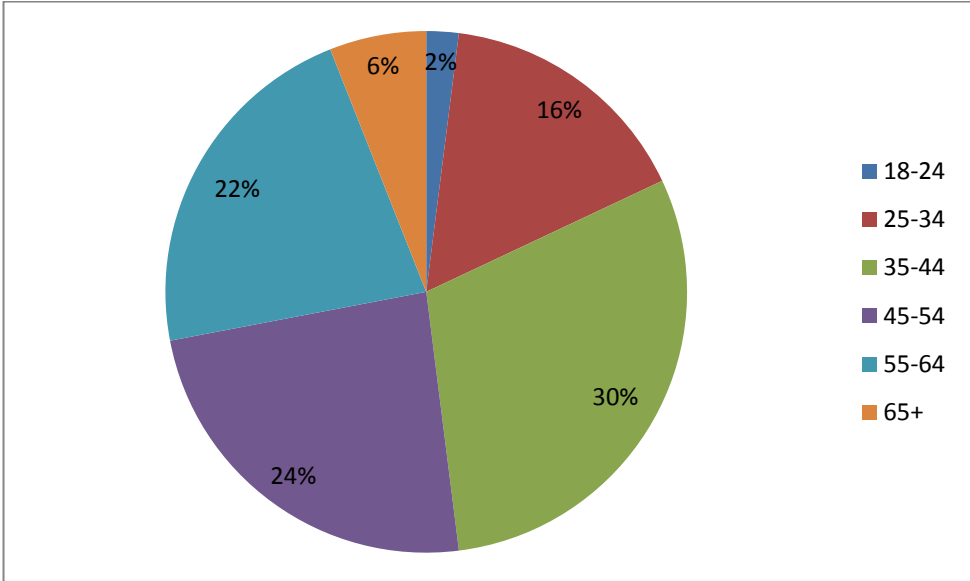


Figure 6: Age of respondents

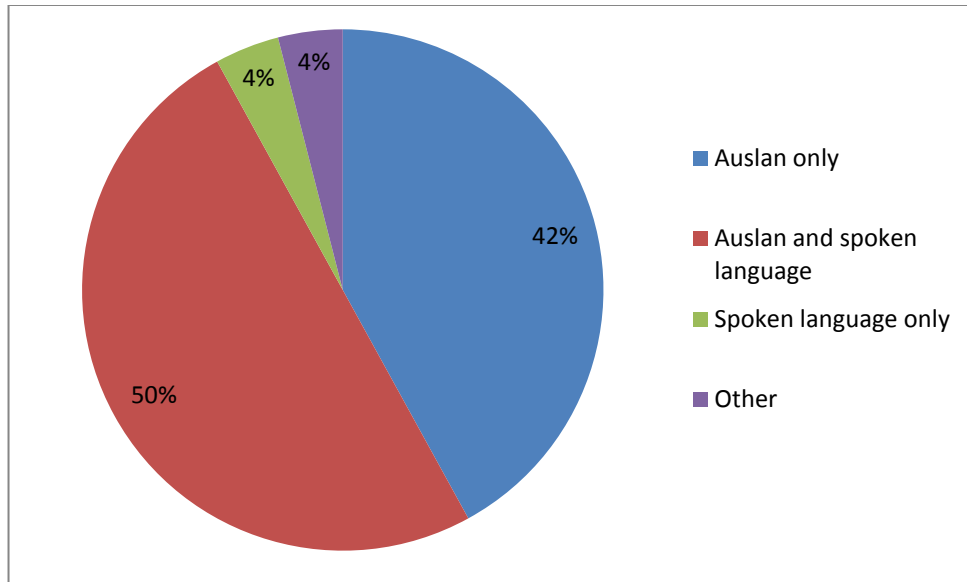


Figure 7: Language preference

4.2.1.1 Emergency communication mechanisms

Figure 8 depicts the methods the Deaf and hard of hearing community use most often to become informed of emergencies. The most commonly used methods (in order from most- to least-commonly used) are television, mobile phones, family members or flat mates, the Internet, and friends.

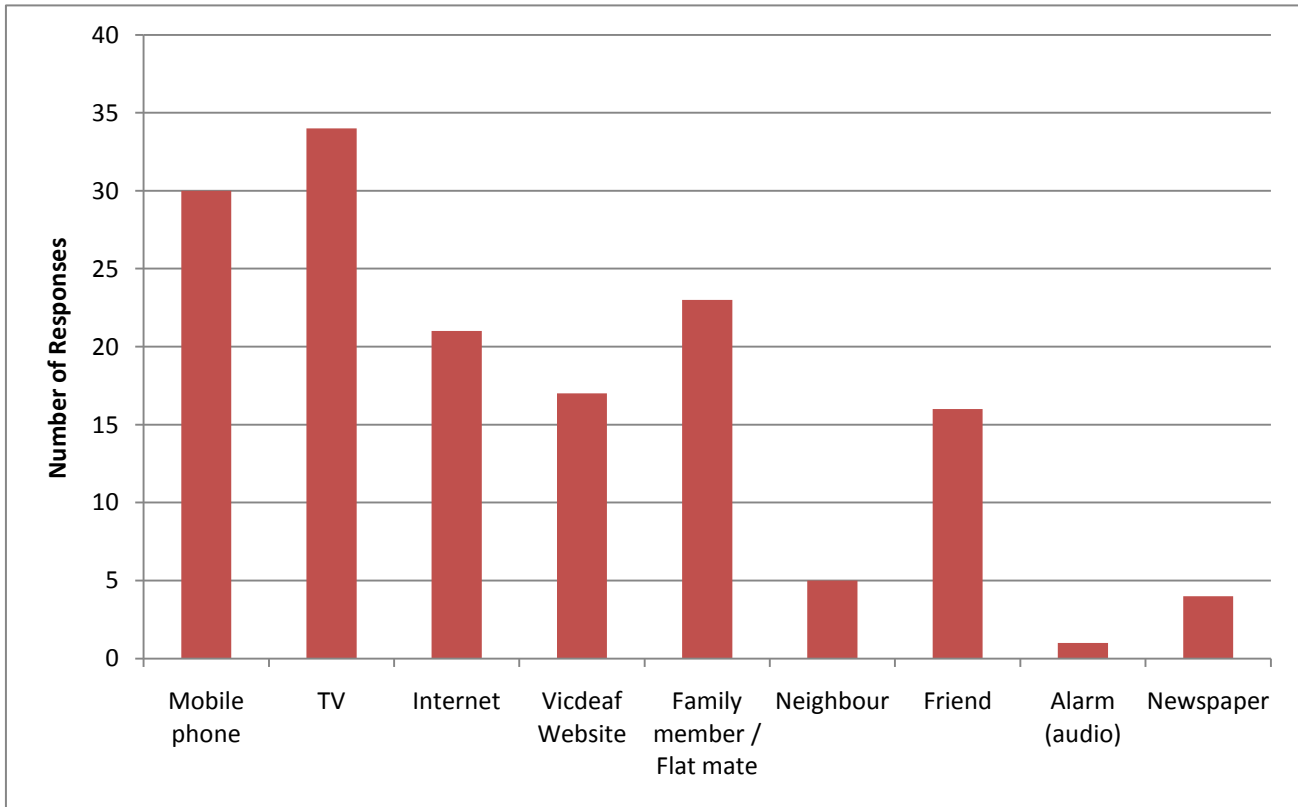


Figure 8: Self-reported methods for receiving emergency warnings

4.2.1.2 Opinion on current communications methods

The survey asked for a general rating of the emergency communication, on a scale from “very poor” to “excellent.” The results are depicted in Figure 9. About 46% of the responses indicated that the system is unsatisfactory (“poor” or “very poor”), about 38% of the responses indicated that the system is “okay”, and only about 16% of the responses indicated that the system is satisfactory (“good” or “excellent”).

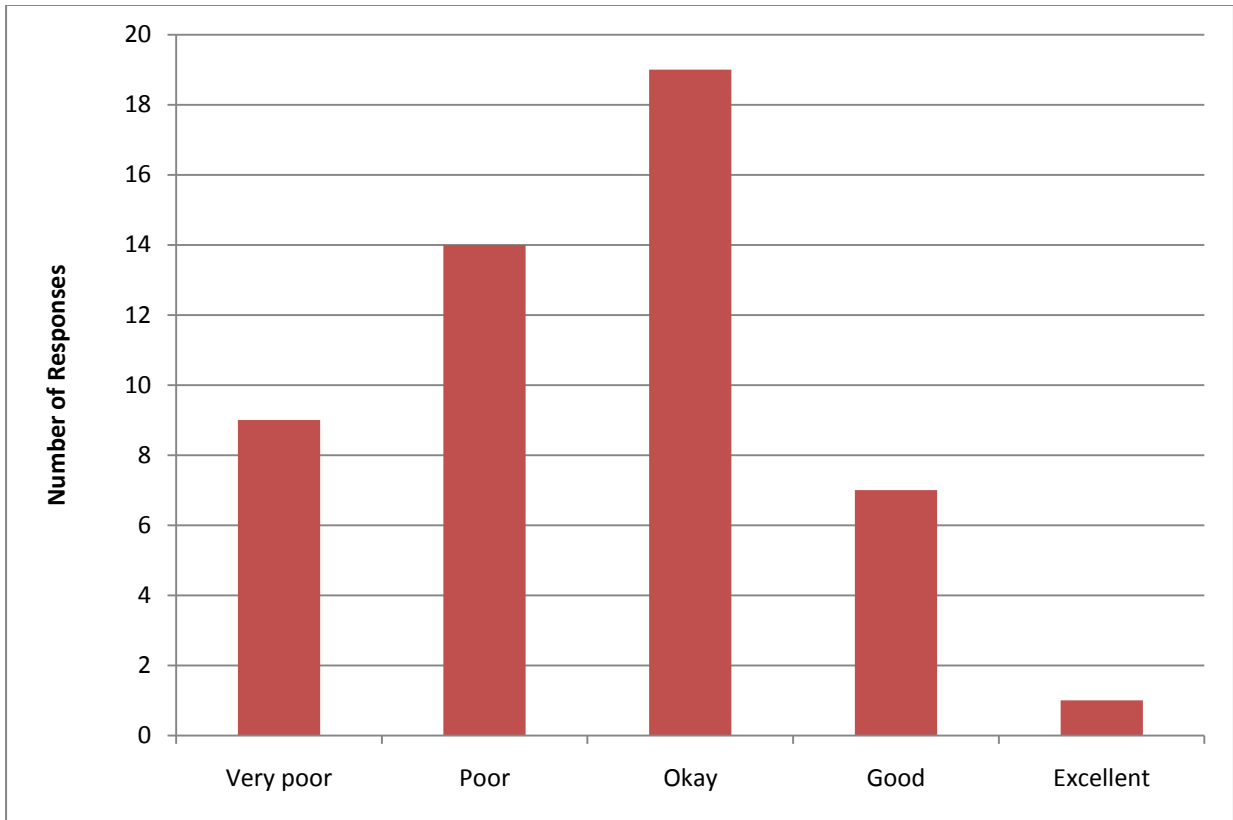


Figure 9: Overall rating of Victoria's emergency system

To further understand the Deaf and hard of hearing community's opinion of the emergency communication system, the survey asked whether or not specific methods worked well (Figure 10). This question was optional, so if a respondent did not feel a method worked particularly well or poorly, he or she would not have to provide a response. From this, we can gather the methods that worked most effectively were mobile phone SMS, television broadcasts, Internet websites, and family members and flat mates. However, mobile phone SMS, television broadcasts, and Internet websites are also the methods that worked poorly most often.

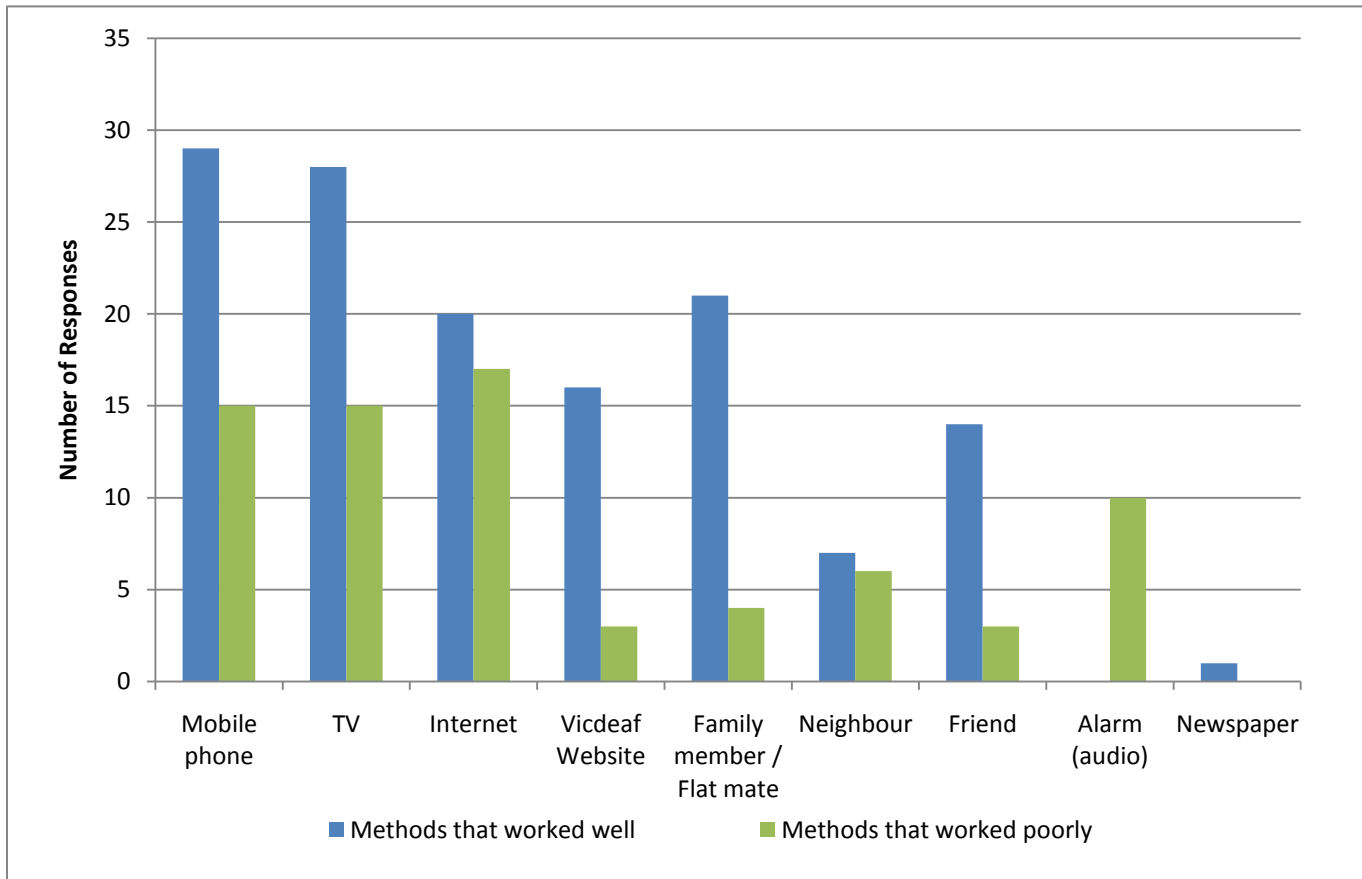


Figure 10: Satisfaction with current methods of emergency communication

To determine why this is true, we conducted analysis on specific methods. In terms of television, from the survey responses, we gathered that 74% of the Deaf and hard of hearing community has their television turned on 5-7 nights per week. However, as depicted in Figure 11, only about 38% of the community feels confident about actually receiving emergency warnings on television. To help improve this form of emergency communication, about 82% of the Deaf and hard of hearing community feel they would benefit from an interpreter signing during emergency broadcasts. The 18% of the community that does not feel they would benefit from an interpreter are also either hearing or hard of hearing; therefore, 100% of the respondents that are entirely Deaf feel they would benefit from this service.

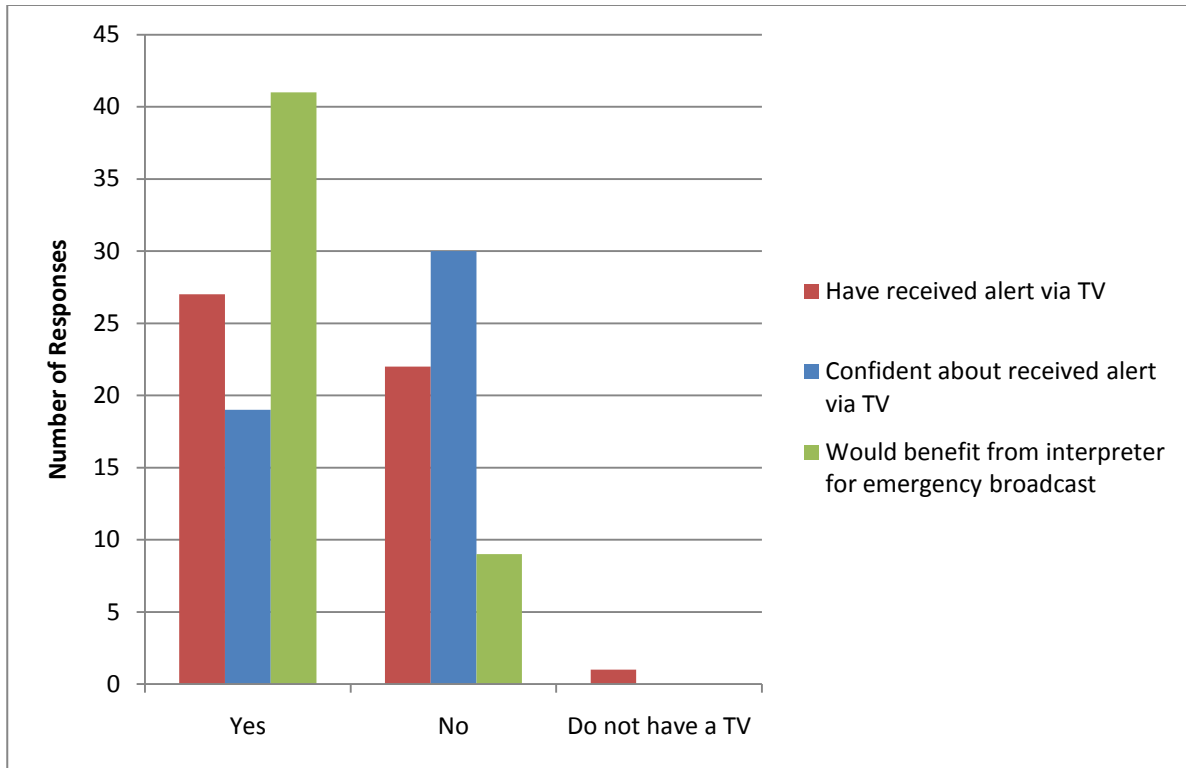


Figure 11: Emergency communication via television

4.2.1.3 Preferred warning method

The survey asked the Deaf and hard of hearing community for their preferred method of emergency communication; that is, which method they believe would be most effective in reaching them during an emergency. These results are shown in Figure 12. Clearly, the most preferred method is mobile phone emergency SMS messages. However, as seen in Figure 10, mobile phones are not the most commonly used method and are viewed as one of the most ineffective methods by the Deaf and hard of hearing community. Analysis of this is conducted in the next section.

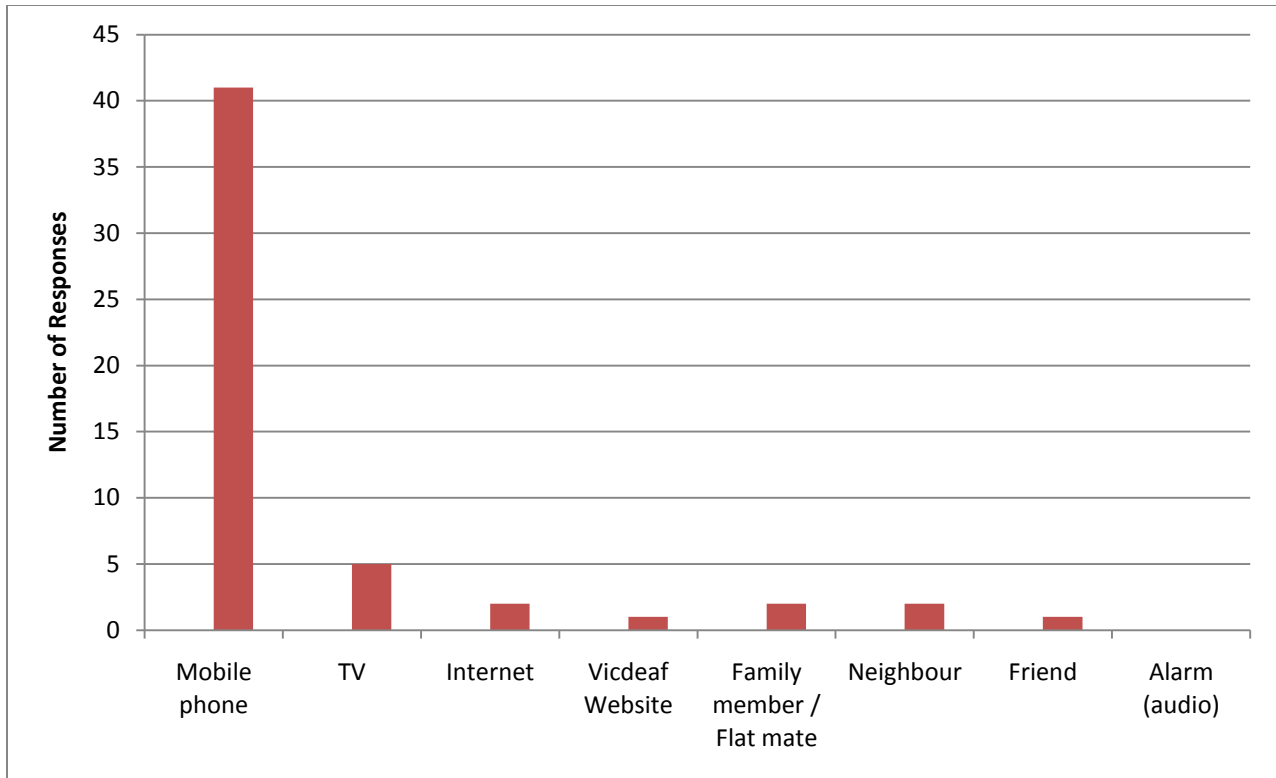


Figure 12: Preferred method of emergency communication

4.2.1.4 Awareness of emergency communications methods

Even though emergency communication via mobile phones is the most preferred method of emergency communication, it is not most utilized by the Deaf and hard of hearing community. To understand this further, we analyzed the results of questions in our survey about current emergency systems available via SMS messages (shown in Figure 13); more specifically, the Emergency Alert system detailed in Chapter 2.3.2. From this, we gathered that only 26% of the Deaf and hard of hearing community actually know about Emergency Alert.

For further information about how well the Deaf and hard of hearing community is educated about what they should do in case of an emergency, we asked if they had an emergency plan for their home. Knowing what should be done in the event of an emergency is crucial for safety. From the surveys, we found that only 26% of the community has an emergency plan.

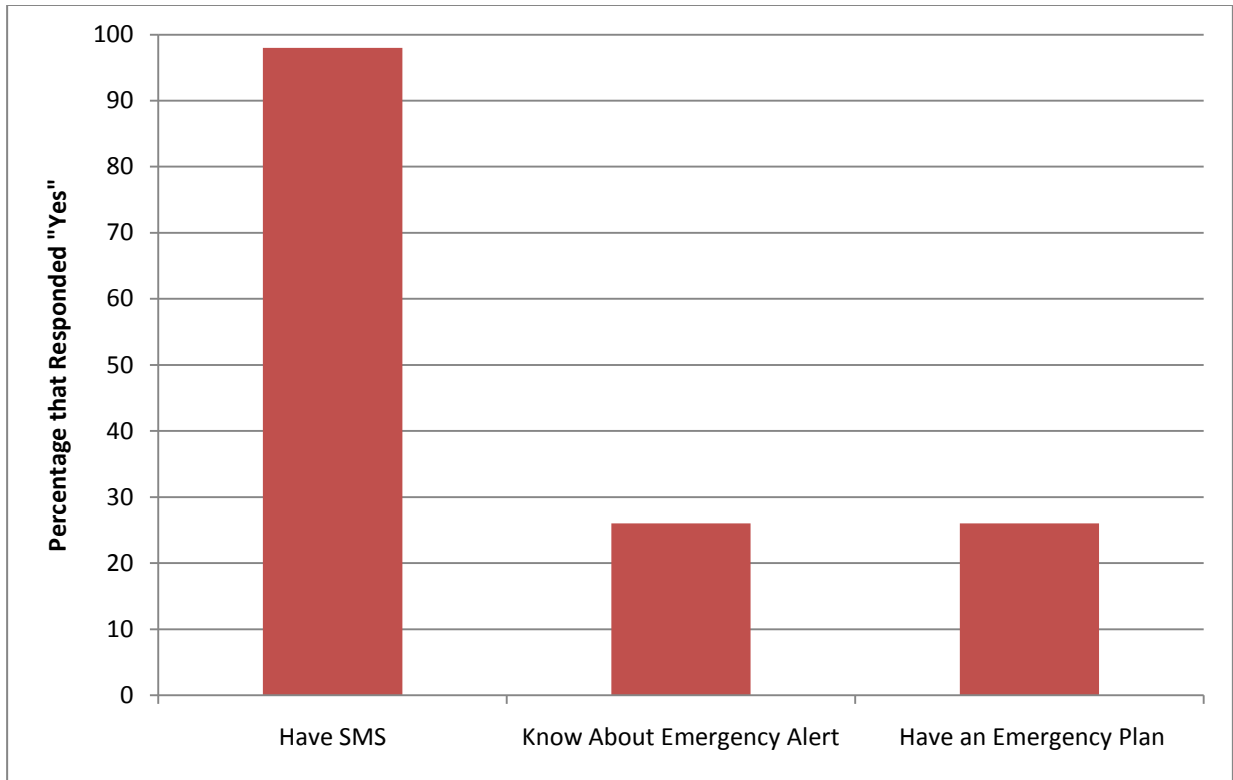


Figure 13: Awareness of emergency communications

4.2.2 Interviews with Victorian Deaf Society staff members

During the course of the project, we interviewed David Peters and Michael Parremore, who are both Deaf staff members of the Victorian Deaf Society. Peters is the Information Officer at Vicdeaf, and Parremore works with the Communications Department. Both staff members are very familiar with Victoria’s emergency communication systems.

4.2.2.1 Interview with David Peters

The team interviewed David Peters about Victoria’s emergency communication system, as well as what about it he believes should be improved (full transcript in Appendix C). He believes that Victoria’s emergency communication system is “really not good enough” and should be held to a higher standard. He further explained that this is because many warnings are received too late. Warnings about Black Saturday, for example, were sent out via SMS on mobile phones. However, many Deaf and hard of hearing people did not receive a SMS until the day after Black Saturday. At that point, it was simply too late to respond to the warning.

Furthermore, Peters noted that many warnings that are sent out are not clear enough, or are not effective for the Deaf and hard of hearing community. The SMS warning sent out about Black Saturday, for example, instructed the recipient to seek further information from their local ABC radio station; this does not inform the Deaf and hard of hearing community about the emergency, as a text-based version of the radio broadcast was not available. They did not learn that the message was not specific for them until several days later. However, Peters also said that an SMS system tailored specifically for the Deaf and hard of hearing is not entirely necessary, but instead, the messages sent out just need to be clearer and should be accessible to all special-needs groups.

According to Peters, emergency news broadcasts on television are the only communication method that has been consistent in Victoria. It is used for all types of emergencies, and the messages appear as text while the program that is currently on continues running in the background. However, these also need to be made clearer. Peters noted that Auslan is not simply a subset of English; rather it is its own language. Therefore, many Auslan users are not entirely literate in English. Messages broadcast in simple, plain English would ensure that more Deaf and hard of hearing people receive that information. Furthermore, he noted that it would be very beneficial and important to have the messages in both written English and in Auslan, as many Auslan users are more comfortable with Auslan and understand it much better than English.

To reach the Deaf and hard of hearing community more effectively during emergencies, Peters spoke at length about how a town's local Country Fire Authority (CFA) should have a database of all Deaf and hard of hearing citizens in the area. This database would include names and addresses of those who need extra help during emergencies. If the CFA has this information during an emergency, they can directly contact the registrants by going to their homes to let them know what is going on and what they should do. However, Peters also stressed the point that Deaf and hard of hearing people are at a disadvantage in terms of receiving information. They would have to wait for a person from the CFA to personally contact them, for an SMS message, or for the information to be made available online or in a newspaper. Hearing citizens, on the other hand, can receive a warning via radio or the bushfire siren.

Of all the communication systems that are available to the Deaf and hard of hearing community, Peters believes that SMS messaging could be the most effective. Systems like

websites and television require a person to be at home or somewhere with readily available access to these technologies. However, most people carry their mobile phones with them on a regular basis – “As quickly as a hearing person may hear something on the radio, a Deaf person would...capture it via SMS.” This system needs to be improved though, because (as Peters noted) the messages sent via SMS are not entirely clear or timely.

Another important issue Peters brought up was that the Deaf and hard of hearing community, for the most part, is not well educated about what types of warnings are available to them. Many of them, especially those in rural farming areas, do not know what to do in case of an emergency. To improve this, Peters mentioned that they need to keep in good contact with their neighbors and have a set emergency plan in place. Their neighbors can reach them much more quickly than the CFA, and knowing what to do after they receive information about the emergency is very important.

The interview concluded with Peters comparing the Victorian system with the American system. In America, many emergency broadcasts on television have an interpreter signing next to the speaker. This is not the case in Victoria, where an interpreter must be requested. Even with the request, there is often an issue with who is responsible for paying. If there is no request, the interpreter is not provided.

4.2.2.2 Interview with Michael Parremore

The team interviewed Michael Parremore about his own experience with Victoria’s emergency communication system and also about his own interviews with Deaf and hard of hearing people who have been directly affected by emergencies like Black Saturday (full transcript in Appendix D: Interview with Michael Parremore). Personally, Parremore has been notified of emergencies by televised news broadcasts, family, or friends. He noted that the news flashes appeared very quickly on the screen, so he had to read the warning several times before he understood what the message contained. To make the message clearer, he believes that an interpreter should be on the screen signing the message.

Parremore has received emergency SMS messages since Black Saturday, but they have only been during tests, not an actual emergency. He thought the SMS message he received was clear enough for him to understand, but he also noted that he is very literate in English. For Deaf and hard of hearing people who are not as literate in English, he believes that the messages

should be made clearer. He also brought up the same point Peters made about the SMS he received on Black Saturday, which instructed him to listen to his local ABC radio. He believes it would be beneficial to have SMS messages specifically for the Deaf and hard of hearing community to ensure they receive all the information.

Parremore has personally interviewed Deaf and hard of hearing people about their experiences with emergencies and he has received many of the same complaints and recommendations that Peters has received. Firstly, Parremore has found that many of his interviewees believe the local CFA should have a database of all Deaf and hard of hearing people and where they live, so they can contact them directly. Furthermore, some of his interviewees also believe that the CFA should have the authority to break into homes because knocking on the door or ringing the doorbell does not work. Parremore suggests that Deaf and hard of hearing people need to keep a good connection with their neighbors, so the neighbors can inform them if a warning is broadcast on the radio. He also received a recommendation from a few interviewees that Deaf and hard of hearing people should have a hearing dog trained to respond during emergencies. Even though it is not a scientifically-sound method, people have told Parremore that they know something is wrong based on their dog's odd behavior.

Parremore is the editor of Vicdeaf's Communicate, a monthly newsletter for Victoria's Deaf and hard of hearing community. After the Black Saturday fires, a member of the Deaf community, who requested to be anonymous, wrote an article about his experience that day (Vicdeaf, 2009). His story started at 3 p.m. when he lost power. He looked outside to see large clouds of smoke, which was his only warning of the oncoming bushfire. Because he had no power he could not check the news on television so he used his laptop, running on battery, to check the CFA, ABC news, and nine MSN news websites, but did not find a bushfire warning. He did not know what was going on and he described feeling "no hope because no news."

Hours later, police came to his house, but he could not hear the doorbell or any knocking. When they received no response, the police rushed off and did not wait for him. He realized that danger was imminent because the smoke and fire were so close. Without even packing his belongings, he started driving and started driving to the CFA Group Officer station. Trees had fallen into the road and there was smoke everywhere, so it quickly became hard to see and dangerous to drive. He followed the CFA trucks but did not go to the station because it would be

too difficult to communicate; he could only communicate with Auslan. He instead decided to go visit a friend who gave him more information.

He stayed with his friend for two weeks and attended daily meetings at the Local Community Recovering Groups. He describes how “there was always an Auslan interpreter at the meeting. It made me feel better...” (Vicdeaf, 2009). He received the information he was eagerly looking for about his home and what was happening. However, he was still frustrated that he had not been warned about the bushfire. Because the power went out he could not access the television or TTY. He could not listen to the radio and the SMS message came too late. He described the sentiments of many other Deaf and hard of hearing people when he said, “Because I am Deaf and by myself I had many problems with communication and no one to talk to about how I feel” (Vicdeaf, 2009).

Overall, Parremore believes that he would eventually receive a warning of an emergency, but the problem is how quickly he receives that warning. He believes the system has improved since Black Saturday, but there is still room for much more improvement. He said that the SMS emergency messages are a good place to start researching, because mobile phones are a readily available technology. Then information on websites and television broadcasts should be improved by clarifying the content of the message and providing interpreters. Finally, The Herald Sun should have a dedicated section for emergency updates.

4.2.3 Interviews with Deaf and hard of hearing community

The team interviewed 24 members of the Deaf and hard of hearing community and heard many noteworthy experiences of confusion and frustration with emergency warnings. One interviewee told a story from Black Saturday of a Deaf friend who lives alone:

“[She] had no idea until the very last minute. Like 20 minutes before when the neighbors were saying ‘Get out! Get out!’ and she said ‘What?! Pack my bags now? Go now?’ So she followed her neighbors in her car. So she was quite lucky that she got out safely because she had no idea that entire day” (Appendix G, Interview 9).

This story illustrates one example of the lack of emergency communication for the Deaf and hard of hearing during Black Saturday. The following sections provide other experiences and opinions of the emergency communication system in Victoria. The interviews were based on a standardized set of questions that focused primarily on warnings via the telephone, SMS,

television, websites and personal notification. All interviews have a possibility for interpreter error.

4.2.3.1 Telephone

For most hearing impaired interviewees, the telephone as a means of communication is useless. Even an interviewee who has a cochlear implant said that the phone is not of much use to her. However, she spoke of a telephone number that one could call and ask a yes or no question. The response would either be “yes yes” or “no.” She said that this format would allow her to tell if the answer was two syllables or one (Appendix G, Interview 11). This system would be useful for a small population of the Deaf and hard of hearing community.

4.2.3.2 SMS

Of the 24 people interviewed, 14 said that SMS would be the most effective way to reach them during an emergency. One interviewee said “most Deaf people can’t live without mobile phones and that’s why with me, I have mine with me always” (Appendix G, Interview 10). Although many Deaf and hard of hearing people have their mobile phones with them, not all received the test SMS warning message that was sent out. We spoke to some people who did and they thought it was a great idea and wondered why the system was not in place before. One interviewee was unsure of what the SMS message was but after she spoke with her mother, who is hearing, she understood it better (Appendix G, Interview 20). To help clarify warnings, one interviewee suggested setting up a special SMS service that allows a person to ask questions and receive answers through SMS (Appendix G, Interview 10).

4.2.3.3 Television

The Deaf and hard of hearing cannot fully access television unless there is closed captioning. One interviewee spoke in depth about an experience with television and closed captioning during an emergency, saying “It depends on who has the captions. I had to quickly go through and find one with captions. I really rely on the captions. It doesn’t matter if the person is talking, I have no idea. I’m not interested in the face I want to see the writing. Sometimes there’s nothing there, they just do a summary and I want it quickly” (Appendix G, Interview 10). This interviewee also explained how captioning is not provided all the time and that not all channels have them.

The lack of closed captioning became a problem for one interviewee during Black Saturday:

“I turned on the TV, but there was no captioning on the TV. It was on the news. There was footage. You could see people milling about and you could see emergency services but there were no captions on the TV so I had no idea what was going on. It was really frustrating. So I asked my Mum, who’s Deaf, she can’t hear but she can lip-read. Do I rely on my Deaf Mum? And she’s lip-reading and saying ‘Kingslake?’ And I said ‘Are you sure?’ And she said ‘Yeah, I think?’” (Appendix G, Interview 9).

This interviewee was out of town during the Black Saturday fires, and was allowing her friends, a hearing couple, to stay in her house. They managed to escape before the fires burned the house to the ground. She suggests for the future that “if captioning isn’t possible to occur, perhaps the channel – channels 9, 10 or 7, the news channels – could put up a subtitle saying ‘This is an emergency. For Deaf or hard of hearing people, please contact such and such’” and refer them to another source of information.

Some interviewees saw Black Saturday warnings on television but did not fully understand the message. They knew there was a fire but wanted more information. Others said that having an Auslan interpreter on screen would help their understanding, but one said that the interpreters sign too quickly which makes it difficult to follow.

We received a few other suggestions from our interviewees. One suggested that emergency information found in closed captioning should be large, bold, and have a flashing background to catch one’s attention; otherwise it could be viewed as a normal situation. Another suggestion is to have a special television channel that a Deaf or hard of hearing person could receive all emergency information through an interpreter, similar to DeafTV in South Africa. This channel could also provide the same information in various languages so a hearing person who does not speak English would also benefit from this suggestion.

4.2.3.4 Websites

We found that websites are used by most interviewees; however some do not have the Internet or are not comfortable using it. One interviewee who is comfortable with the Internet logged on to find more information about the Black Saturday fires and found a personal blog page that was of great help:

“I wasn’t sure if it was factual information because it was like a blog and someone was typing in, updating, and it was so fantastic to get that updated information. It was just a random person’s blog and I got information from there, but after that the blog got shut down, but it was brilliant because they did complete updates every 30 minutes. It was fantastic. Luckily I found it. I don’t know who it was” (Appendix G, Interview 9).

This interviewee also looked at the CFA website, but could not find the information she was looking for until she found the blog.

A suggestion made from an interviewee, was that the radio and Internet should provide the same information during an emergency. He suggests that everything broadcasted over the radio should be typed and put online. Therefore, people who do not have access to the radio can still receive the same information (Appendix G, Interview 10).

4.2.3.5 Personal

Of 24 interviewees, 12 rely on or have used personal notification as their form of emergency warning. This includes neighbors, friends, and family who have personally notified them of an emergency either by SMS or face to face communication. One interviewee who works for the Department of Sustainability and Environment, which manages fires in Victoria, spoke of how he personally notified his Deaf wife: “But my wife had no idea though so I was SMSing her and letting her know because she had actually no idea the extent of the fire” (Appendix G, Interview 10). This interviewee knew information about the fire because of where he works.

An interviewee was asked how confident she is that she would receive an emergency warning and she responded that if she was home alone she would be concerned. She would need to ask her neighbors ahead of time to warn her if there was a problem. However, she has not spoken to her neighbors yet, so her neighbors would not know to warn her. Another interviewee suggested that the local CFA have a list of Deaf and hard of hearing people who live in their area so that the CFA can personally warn them of a bushfire. This interviewee made this suggestion in case an emergency was to happen while she is sleeping. “I need a person to contact me, to come into my house and wake me up, or something like that. That’s my biggest concern, if there’s an emergency in the middle of the night” (Appendix G, Interview 9).

4.2.3.6 Overall opinion of the emergency communication system

Overall the majority of the interviewees think that the emergency communication system needs to be improved for the Deaf and hard of hearing. One interviewee said that there is no single way to warn her and that there should be a multitude of systems involved including television, SMS, the Internet, and the CFA. Therefore the entire system needs to be improved, not only one aspect. Another interviewee was asked how confident he is that he would be warned in an emergency and he said “If you’re talking about now I’d say 50-50. In the future, if they set up a special system, then I would be confident I would get the message, but not at the moment. I’m about 50-50” (Appendix G, Interview 10).

4.2.4 General population’s views

The CFA conducted a study about Victoria’s emergency communication system for the general population in September, 2009. The study found the method most utilized by Victorians is the government’s Australian Broadcasting Corporation (ABC) radio stations – “If there is a warning, you listen to the radio religiously” (CFA, 2009). Many people have found their local ABC radio station to be the best method, as it is easily accessible, can be used even if there are power outages (via battery power or car), and one can listen to the radio simultaneously as they prepare for the emergency. However, the CFA also found that the radio warnings are sometimes delayed, and that the younger generations are less likely to use this method.

SMS messages sent out via mobile phones were also rated to be a valuable method of emergency communication. Although large warnings cannot be sent out over mobile phones (as most phones limit text messages to 160 characters), most people believe it is a reliable way to warn someone because the message can be sent very quickly. Generally, an SMS warning recommends listening to a local ABC radio station. A problem with sending SMS messages to a large population is that the system can jam, resulting in message delivery delay. Regardless, people still believe that it is a good way to warn citizens (CFA, 2009).

Other methods the CFA investigated were televisions, telephones, and Internet websites. The study found that television is a method of emergency communication underutilized by Victorians. However, because power outages are common during bushfires, television warnings may not always be available. Some communities use phone trees (a network of 30-40 people that call and warn each other of oncoming emergencies), but these are less common due to a lack of

organization among communities. Government websites (CFA, Department of Sustainability, and ABC) contain much information concerning warnings and education about warnings. They can be easily updated with real-time information, and can be accessed very quickly, assuming that power has not been lost. The CFA found, though, that less than half of all groups they sampled regularly check the websites during emergencies (CFA, 2010).

4.2.5 Comparison of different perspectives

Overall, the general population of Victoria is satisfied with the emergency communication system. With ABC radio stations informing them about emergency situations, in addition to SMS messages containing directions to listen to the radio, they are confident that they can find information without much hassle. For the most part, they do not feel it is necessary to watch for warnings on television or the Internet, and they can find emergency information independently.

However, the Deaf and hard of hearing community is not satisfied. They cannot listen to the radio, so being warned via SMS to listen to the radio is not effective. Overall, they believe that better SMS and television systems would be the best way to warn them about emergencies. For further communication, they believe that the CFA should have a list of their addresses so they can be contacted if necessary.

This comparison shows that while the emergency communication system is good enough for the hearing population, it is not good enough for the Deaf and hard of hearing community. Many of the methods believed to be most effective by the hearing population rely on audio communication. However, these methods cannot be fully utilized by the Deaf and hard of hearing community.

4.3 Resistance and problems with changes

Although problems for the Deaf and hard of hearing community have been identified, there will be resistance to making changes and improvements. This section describes the potential challenges identified by the team through contacting stakeholders other than the Deaf and hard of hearing, conducting case studies of previous Vicdeaf projects, and studying the system in the United States.

4.3.1 Stakeholders other than the Deaf and hard of hearing

To gain a better understanding of the television broadcasting system and its associated challenges, contact was made with the government-sponsored station ABC. From this correspondence, the team learned that broadcasting clearer warnings on television and having more hours of closed captioning available would be expensive. It already costs about two million dollars a year for ABC to provide captions 90% of the time, which in comparison with their overall budget, is a small amount. Television stations are not required to caption all of their programs and according to Geoff Cousins, Captioning and Compliance Coordinator for the ABC, 100% captioning will not happen for four or five more years. Cousins reported that requiring captioning will take long negotiations between free-to-air networks, Deaf and hard of hearing organizations, and government legislation because captioning is very expensive. The government-funded stations have a budgeted amount for captioning, but commercial stations will have to pay for captioning themselves and may fight to wait as long as possible. Our survey results show that 82% of the responses said having an Auslan interpreter sign the warning on television would be beneficial (see Section 4.2.1.2), but again there is the problem of cost. Also, during emergencies, there might not be time for an interpreter to go to the television station to sign the warning.

In addition to television-related stakeholders, the team looked into problems and challenges that would arise with regard to SMS systems. If a third party, like Platypus, were used to send out the SMS messages, the biggest obstacle in implementation would be cost. Platypus provided the team with a very rough estimate of \$5,000 to \$20,000 to set up this type of system depending on its complexity and requirements. There would be monthly maintenance fees that could cost between \$2,000 and \$5,000 to keep the system running, in addition to the cost of any outgoing messages (estimated at about 12 cents per message; Lamens, 2010). If the attempt were made to send out an SMS message to phones by location instead of registration, there could be issues regarding the recipients' privacy. In addition there could be issues with locating phones if the person has their Bluetooth capability turned off or even if the person was in a crowded shopping center.

For a more general understanding of the challenges involved with emergency preparedness and response, the team met with the MFB (Appendix M). The organization of the

response network and specifics of the alerts were discussed. At a follow-up meeting, the team was allowed to see the Emergency Control Center at MFB and was informed of the logistics of its operation. One of the major outcomes of the meeting was learning about the Emergency Management Manual Victoria (Office of the Emergency Services Commissioner, 2010), which describes the responsibilities of the various organizations during different emergency situations. The MFB concerns itself with making sure there is equal access for all members of the population. However, in order for any action, there needs to be evidence that the current system is not sufficient for the Deaf and hard of hearing. When a gap in provided services is identified between the Deaf and hard of hearing and the hearing population, the MFB will work to close this gap. This is a potential challenge, as one of the team's early recommendations was to have a separate SMS system put in place that sent messages to registered Deaf and hard of hearing individuals. However, since they already receive the SMS messages that the entire public gets, it may be hard to prove there is a gap. A more appropriate recommendation would be to make sure they can read and understand the general messages. This then involves issues such as ensuring preparedness materials provided by the MFB are accessible to the Deaf and hard of hearing. The specific recommendations in Section 5.2 reflect these changes.

Similar to the MFB meeting, the team received the government's opinion on our recommendations at a meeting with representatives from the Office of Emergency Services Commissioner (OESC). For many of the recommendations covered in the meeting, there was not much resistance identified. This was due partly because many of the recommendations do not involve extensive work by the government, and partly because they were aware of many of the problems we identified. For example, accessibility of websites and the information contained therein is already a consideration of the government because of their recent improvements on the emergency system. Similar to the meeting with MFB, the major obstacle to our recommendations identified in this meeting is that adding components of the warning system specifically for the Deaf and hard of hearing is not likely to be the best approach. More specifically, the team thought of having a government-sponsored registry of Deaf and hard of hearing people who would receive specific SMS messages or who would be personally contacted in an emergency. However, an OESC representative pointed out that an emergency is very chaotic and there is already an extensive amount of work for the responding agencies. Adding additional steps for all the disabled groups and maintaining separate registries would only be

adding to the workload. Specific systems can also give people a false sense of security that they will definitely be warned, which is not necessarily the case.

The issue of raising a false sense of security was brought up in the meeting with CFA as well. When there are numerous warning systems in place, people may tend to wait for a warning to inform them of the safest course of action. However, in a bushfire that can change direction quickly and leave very little time for warning, people need to decide for themselves rather than wait for a warning that may not come. Recommendations that add extra systems or methods of communication, although still important, need to address the fact that these technologies should not be relied upon exclusively. For example, if people register to receive preparedness information or emergency warnings as part of a program within their town, the registry needs to explicitly state what it is and what it is not. The people registering need to know not to rely upon information coming to them, but instead make their own decision. This is particularly relevant for rural communities, where there may be slow Internet connections or mobile black spots. As these technological limitations affect the effectiveness of some of the recommendations, they are another important challenge to consider. Finally, with particular regard to the recommendations that involve personal networks, the representative from the CFA explained how they were looking into evidence that people associate more by interest than by geography. This could be an obstacle because Deaf and hard of hearing people may prefer to form their personal warning network with other members of the Deaf and hard of hearing community, rather than their physical neighbors. Although this is not necessarily a large problem, it can affect how communities are taught to prepare for a fire. Emphasis in the past has been on forming relations with geographic neighbors, so some of our recommendations take into account the idea that people of similar interests may be more willing to form personal emergency networks.

4.3.2 Fire Alarm Subsidy case study

We identified another project with some elements in common to ours, Victoria's Fire Alarm Subsidy, which was put into place three years ago. The Fire Alarm Subsidy was established to provide specialized smoke alarms that the Deaf and hard of hearing could use for a reduced price. Regular smoke alarms in Australia only have an audio warning, which is not effective for someone with a hearing impairment. The specialized smoke alarms that also have a flashing light cost more than \$450 which is out of the reach of many. Although the Deaf and

hard of hearing greatly benefit from having these smoke alarms available to them at a reasonable price, the question of cost was the biggest problem in implementing the Fire Alarm Subsidy. Vicdeaf and other Deaf organizations had been periodically lobbying to the government for about 10 years before the program was established.

According to Louisa Willoughby, a Vicdeaf employee who also researched and wrote a review on the scheme, the timing of the Fire Alarm Subsidy's implementation was apparently arbitrary. The previous CEO of Vicdeaf, John Paton, wrote a letter to John Brumby, the Premier of Victoria, about how it was unfortunate that the Deaf had to pay significantly more for a fire alarm than hearing people did. Although in the past the lobbying had been unsuccessful, this time the Premier authorized funding for the project. Willoughby explained that while it was unclear what made this attempt more successful than previous efforts, a \$220,000 Brumby Labor Government funding boost was put in place to finance the project (Minister for Community Service, 2009). Vicdeaf was then responsible for creating the system for how the fire alarms were given out.

The second major issue arose when it came time to determine who was eligible to receive one of the specialized smoke alarms. At first the smoke alarms were only provided to Auslan users, but it became evident that there were a number of other profoundly deaf people who also needed the assistance of these flashing alarms. It took almost six months to change the criteria so that there were multiple ways a person could be eligible for one of the smoke alarms. The new criteria were either to prove fluency in Auslan or provide medical proof of their hearing loss.

Even with this improvement in the eligibility criteria, it is still not perfect. There is evidence that shows that people with a hearing loss of 60 dB or more will not benefit from a regular audio smoke alarm, but the Department of Human Services, the branch of the government responsible for the subsidy, does not want to lower the disability criteria from the current 75 dB cut off. They are afraid that they will not be able to meet the demand for the increased number of people eligible to receive the specialized alarms (Willoughby, 2010).

If the Fire Alarm Subsidy enlightens us to anything about this project, it is that funding has the potential to be the biggest obstacle for a better emergency warning system. It seems that people agree that changes are desired, but figuring out who is responsible for these changes, identifying resources, and how to fairly distribute the resources to those in need are the issues that are going to be the main obstacles for this work.

4.3.3 Video Relay Interpreting case study

The team also investigated Video Relay Interpreting in Victoria, a program recently implemented by Vicdeaf, to identify obstacles that may be faced while implementing changes to the emergency warning system. Video Relay Interpreting (VRI) allows a Deaf person and a hearing person to communicate without having an interpreter with them in the same room. The Deaf and hearing person go to a location where VRI is available, sit next to each other, and watch a screen with a live video of an interpreter (at another VRI location). The process is similar to a Skype conversation. The hearing person is able to talk to the interpreter and the interpreter will then sign to the Deaf person and vice versa. The benefit of using the VRI system is that it significantly reduces the amount of time an interpreter needs to travel to and from a job, which saves significant time and money.

Vicdeaf employees Marc Curtis and Phil Harper originally identified the need for a VRI system in Victoria and helped to implement it. In a previous Interactive Qualifying Project, a team of WPI students worked with Vicdeaf to identify VRI systems that have been working well internationally. Although it took seven years from the initial conversation to the implementation of the system, the work did not face any resistance because many believed that it would be a beneficial program in Victoria due to the success of international VRI systems (Curtis, 2010).

Victoria's VRI system is funded by the Department of Human Services. It cost \$2 million to implement the system, and an additional \$5,000 a month to maintain it. Vicdeaf, and more specifically, Marc Curtis and the project manager, are responsible for maintaining it (Curtis, 2010). Our team is using a similar approach to increase the validity of our recommendations. By looking at what foreign countries have done, the chances of successfully implementing an effective warning system are increased.

4.3.4 United States emergency warning system case study

While it is important to understand what systems currently operate around the world, it is also important to understand the problems that were overcome in their implementation. In creating a structured and complicated emergency communication system, there are many challenges that arise during the development of the system. Although the challenges of and resources for implementation vary from nation to nation, one factor is always true: being aware

of potential obstacles is a crucial consideration when recommending changes to existing infrastructure, such as emergency warning systems. In order to better understand the problems Victoria might experience when implementing the team's recommended changes, we investigated a case study on the United States' emergency warning system. The United States was chosen not only because it has an advanced system, but also because the system has undergone substantial changes since Hurricane Katrina in 2005. Many recent reports and studies are readily available that describe how the emergency communications system could be improved, especially in regard to the disabled population, who encountered particular difficulties during this disaster (Federal Emergency Management Agency, 2008). These include the National Council on Disability's *Effective Emergency Management: Making Improvements for Communities and People with Disabilities* (2009) and the Federal Emergency Management Agency and the Department of Human Services Office for Civil Rights and Civil Liberties' *Interim Emergency Management Planning Guide for Special Needs Populations* (2008). Both of these reports provide extensive details on what problems were encountered with the system and how those problems need to be addressed in the future.

As mentioned in their report, one of the National Council on Disability's main objectives is to look at federal legislation and determine how it affects disability groups. The report is a result of that, and looks at the preparedness, response, recovery, and mitigation phases of an emergency. It also includes information for emergency managers, volunteer organizations, and the future outlook of emergency management as it pertains to disabled groups. The Federal Emergency Management Agency's report is less extensive, but focuses solely on planning for emergencies as it applies to disabled people. The two reports had a lot of similar information and often overlapped with other reports read by the team. Since these were the two most recent and comprehensive reports, the information in this section is a compilation of the most relevant points they brought up.

4.3.4.1 Preparing for an emergency

The effectiveness of an emergency warning system starts long before a warning is actually sent out to the population. The two main aspects that must be addressed prior to an emergency are planning the overall system and educating the public.

Both reports identified that one of the major problems with emergency planning in the past was that it did not include members of the disabled community. Having a diverse demographic involved in the planning of the emergency warning system ensures that it is effective for as many members of the community as possible. Since it is the disabled who understand their specific needs best, they are able to provide valuable insight on issues that might otherwise go unchallenged. For example, as part of the planning process, there are often rehearsals and tests of the system. A broad demographic including the disabled is needed to participate in these tests to ensure effectiveness. A problem generally associated with text messages is that people with low literacy or that use a minority language (including signing) do not fully understand the complicated messages, even if they have a basic understanding of the language. These issues have been overlooked in the past, but by including people with a wide range of backgrounds in the planning phase, they might be surmounted early in the process. The largest problem with implementing this idea into all emergency plans is that it takes extra effort from the planners to contact and include representatives from all the minority groups that might have special needs. While under time constraints and when dealing with an already complicated issue, this extra effort may be deemed unnecessary. One argument that could be used to try and help persuade the planners to make this effort is to have them consider the longer-term effects for the general population. Some of the changes necessary for a disabled person are useful for a non-disabled person. For example, clarifying the messages sent out via SMS, while crucial for a Deaf person, would also help the general public. Although the short-term resources to implement this may not be available, it is beneficial to consider how planning for the long-term might save more lives and cost less than the recovery efforts of a poorly planned system.

Since a well-planned system is not effective if the public is not educated on how to properly use it, public education is the second component of a successful preparation. When a warning is sent out, it needs to be understood and acted upon in the intended manner. Individuals need to know what they should do, where they should go, what they should bring, who they should contact, and have all of this accessible as quickly as possible. For example, if a hard of hearing person evacuates without bringing his or her survival kit with extra hearing aid batteries, that person may run into difficulties when the batteries run out. This public education can take numerous forms, including websites, accessible public programs, billboards, news reports, or

flyers. A government website called Disability Preparedness⁷ provides extensive information and other useful links on many aspects of preparing for emergencies, including how to implement plans for the disabled, legal rights, and how individuals should prepare themselves for an emergency. The largest obstacle to overcome with regard to educating the public is in making them aware of the individual responsibility to prepare. Emergencies are fairly rare, so most people do not concern themselves with preparation.

4.3.4.2 Technological warning methods

Just as it is important to have an effective plan in place, it is also necessary to have a well-designed system for actually distributing the warnings. This section will look at television broadcasts, telephone systems, SMS, and email/websites in terms of why they are beneficial, the challenges associated with them, and the recommendations for overcoming these challenges as presented in the two US reports.

Television broadcasts are one of the most popular ways for people to get their news and daily information. As such, it is an effective and important means for distributing emergency warning information. The problem arises in making this information accessible to all people. It takes extra effort, hassle, and money on the part of television broadcasters to make the warnings accessible, such as by providing captions. In the US, this problem was surmounted by legal mandates to carry captioning. In October of 2005, the Federal Communications Commission strengthened its legislation that mandated all emergency warnings and other potentially life/health-saving information must be presented both visually and aurally so that it is accessible to the disabled (Federal Emergency Management Agency, 2008). A few years earlier, they had started to strongly enforce captioning rules by issuing Notices of Apparent Liability for Forfeiture. For example, these were issued as warnings to broadcasters in California after they did not provide adequate captioning during wildfires in 2003. However, the National Council on Disability stated that “compliance with FCC policies lags considerably in terms of implementation. Stations report a lack of closed captioners and note the high cost of such services and the lack of availability of captioners during an emergency.” (National Council on Disability, 2009) Although solutions to these problems are a constant work in progress, it is still

⁷ <http://www.disabilitypreparedness.gov/>

an improvement that the issue of accessible television broadcasts is now a consideration in the design of US emergency warning systems (Department of Homeland Security, 2006).

Perhaps the best-known method of accessing emergency help and getting information in the US is through the 911 emergency telephone number. Children at a young age are instructed to “call 911” if there is an emergency and that advice is echoed all over US culture. Naturally, when there is an emergency and an individual feels threatened or insecure, dialing 911 is one of the first strategies they will use to report a hazard and ask for help. Due to its widespread use, it can also be used as an effective way to warn the public of an emergency. The issue with having a telephone number to call arises mainly for the Deaf and hard of hearing population, who might not be able to communicate through a regular phone. For this reason, all 911 answering stations must be TTY compatible, which allows individuals to type and read messages rather than speak and listen (National Council on Disability, 2009). Telecommunications Relay Services (TRS) are available to translate the written text into speech, but this may cause some delays and take longer than directly calling 911. The National Council on Disability (2009) also recommends a backup system more than 200 miles away in case the primary and secondary stations are incapacitated or otherwise do not work during the emergency.

SMS notifications are becoming more widely used in the US as well. Most small-scale systems now work on a registration basis, where an individual can sign up online to receive warnings. This works well for people who speak minority languages, since they can sometimes choose the language to receive the warning. For the Deaf and hard of hearing, the Common Alerting Protocol will allow videos to be sent to their mobile phone, so they could even watch someone signing. Since mobile phones are widely used and the registration allows for more personalized adjustments to the message, this technology can be particularly effective for the disabled community. In Oklahoma, a new system called the Oklahoma Weather Alert Remote Notification (OK-WARN) was put in place specifically to warn the Deaf and hard of hearing. There is no cost to the participants, other than having a pager and access to email. The total cost of setting up and getting a one year license of the system was \$13,000 (National Severe Storms Laboratory, 2009). A copy of the form used to register for the service is included in Appendix J as a reference.

Emails and websites are also useful tools for warning people in emergencies, as they can be accessed at any time provided there is an Internet connection. Internet connections are often

more resilient during emergencies than phone lines and wireless services, which are more susceptible to failure and overloading. Steps can be taken to make them accessible to a wide range of people, such as ensuring the visual content is clear and the message simple yet informative. The major drawback to these methods is that people must actively seek them out and use them. They may not always be checking their email or websites, which limits the effectiveness. Websites might also be out of date, or in the case of a power failure, may not be accessible. To overcome these drawbacks, these methods are best used in conjunction with other methods.

4.3.4.3 Personal warning methods

In addition to technological methods of receiving warnings, many members of the disabled community rely on family, friends, or other more personal forms of contact. Facilitating this contact and extending the network of people in contact with each other can be helpful in disseminating information about an emergency warning.

Generating registries, or lists of people with their contact information and their special needs, is another tool that can be used to help emergency responders get in touch with members of the community. By having a list of those individuals that are likely to need help in an emergency, the emergency responders can better use resources to help those who need it most. However, this system has many problems. For example, the registry is generated on a volunteer basis, so it is not likely to be comprehensive. Not everyone is comfortable disclosing personal information to the government or other organizations, and others may not want to identify as “disabled.” Also, since there is no central registry in the US, information is often gathered from many different sources. It is difficult to keep them up to date, and people may not even be at the location they registered for. For example, if someone gives their work location as the place they will be during the day but they take that day off, it could cause confusion trying to contact them. The upkeep of these systems can be very costly and time consuming as well. Although many of the previous solutions can be used to address some of these issues (such as government funding and advertising the importance of registering), there has not been a lot of scientific research on what types of registries work under different situations.

Finally, creating networks of people can be effective at quickly and personally passing along a warning. Rather than having a registry of individuals, places like nursing homes or

medical centers can be contacted by emergency officials once, then the information spread internally. It is also useful for the disabled to have a group of people that will be responsible for passing along the warning when they receive it. However, this method, like registries, has a lot of implementation issues. Although it does not have a major cost component, people often forget about their responsibility towards others in an emergency. This is one of the reasons why a “buddy system” does not always work. In addition, people may be difficult to find during emergencies, or they may not be able to communicate effectively (for example, a Deaf person might not notice a person knocking at the door). Information can also be altered as it is passed from person to person, which results in an inaccurate message being propagated. Phone trees, or having each person call a list of other people, have the same problems as telephone messages (they need to be TTY accessible, phone lines may be down).

The information contained in these two reports provides valuable insight for the state of Victoria in any future attempts to implement a better emergency warning system. Extensive research has already been conducted and documented in the United States with regard to the disabled population’s accessibility to emergency warnings. There are many problems, complications, and obstacles to overcome with trying to implement the necessarily widespread and advanced emergency warning system. However, by analyzing the information in these two reports and considering the lessons learned in the US, the team was able to make more appropriate recommendations for the Victorian emergency warning system.

4.3.5 Additional challenges

After analyzing the results and gaining more experience identifying challenges, the team identified additional challenges that might be faced by implementing the recommendations. First, is a lack of education amongst the Deaf and hard of hearing community about warning systems and emergency plans. However, the Deaf and hard of hearing might not want to watch a presentation or read a pamphlet of information. This community is very diverse in English literacy and Auslan fluency so they might not be willing to learn about where warnings come from and where to get more information unless it is in their preferred language. This could also explain in part why 34% of people had problems with Internet warnings. Websites often do not have warning information written in plain English or videos of the information in Auslan. Incorporating these changes might help the Deaf and hard of hearing understand warnings

clearly. However, problems arise regarding cost of video equipment and hiring someone to sign. This change is also time sensitive and an emergency might occur too quickly for a video to be made and uploaded to websites, as interpreters may be difficult to find on such short notice.

Another challenge arises from survey respondents and interviewees suggesting that the local CFA should personally contact them in the case of a bushfire based on a list of the Deaf and hard of hearing people in the area and where they live. If the CFA cannot or does not go to a house on the list, they may be legally responsible for any harm to people or property at that location, and may be vulnerable to lawsuits. One survey respondent even went so far as to say the CFA should break down the door or window to notify Deaf and hard of hearing people because knocking on the door will not help. If the person does not want a broken door or window, the CFA could be held responsible. Also, most members of the CFA probably do not know Auslan and might not be able to effectively communicate to sign language users.

CHAPTER 5: CONCLUSIONS AND RECOMMENDATIONS

This chapter provides concluding remarks on the research and data analysis conducted by the team. The recommendations that follow are based on these conclusions and are provided to help Vicdeaf and other related organizations improve the Victorian warning system for the Deaf and hard of hearing.

5.1 Conclusion

As an initial research step, the team conducted background research on emergency communication systems in Australia, the United Kingdom, the United States, Canada, South Africa, Spain, Greece, and a proposed international system. These countries were chosen either because they are technologically advanced or prone to bushfires. For all countries, the research focused on disability legislation, characterizing the warning system, and accessibility for the Deaf and hard of hearing. Although the countries varied greatly in regard to the strength of their legislation, most countries had a system organized from the local level up to the national level. Many of the methods for contacting the Deaf and hard of hearing were the same around the world. In general, the stronger the legislation a country has in regard to providing emergency warnings for the disabled, the more comprehensive a system they have. Furthermore, the more methods of providing warnings and the more organized the system is, the greater the chance it will be effective for the Deaf and hard of hearing.

The next objective of the project, determining the Deaf and hard of hearing community's satisfaction with the current system, was conducted primarily on-site in Victoria. The team sent a survey across Australia and received 50 responses coming from Victoria and 18 from other Australian states/territories. The team also interviewed Vicdeaf employees David Peters and Michael Parremore, both of whom provided valuable information on Victoria's emergency communication system. We also conducted interviews at the Casey Deaf Club, at a senior meeting at Vicdeaf, and with some of the individuals who completed the survey. A total of 24 people were interviewed, providing insight into personal experiences and suggestions of the Deaf and hard of hearing community. The general consensus of the community was that the system needed to be improved, and the preferred method of receiving a warning is a clearer SMS message. Another commonly mentioned problem was not having captioning during television

broadcasts. Along with these technological changes, the team identified that the community needs to be better educated with regard to emergency safety.

The last part of the project looked at challenges and obstacles that were likely to arise when trying to implement changes to the warning system. By talking to other stakeholders, looking at Vicdeaf's previous projects, and examining the history of the US system, the team was able to identify problems that were likely to arise with our recommendations. The most prominent problems were cost, determining which organizations or government branch should be responsible for implementing these changes, motivating the Deaf and hard of hearing community to educate themselves and become involved, and the large amount of time to implement changes. These challenges and the recommendations they pertain to are explained more fully in the following section.

5.2 Recommended changes to the emergency communication system

The following recommendations were generated using information gathered through all aspects of the project. They are made to Vicdeaf as the organization that needs to initiate them, but include the other relevant organizations where applicable. The actual recommendations appear in bold, with the reasons for each recommendation, possible implementation ideas, and potential challenges also provided. The recommendations were grouped into the following categories: preparedness, emergency telephone lines, SMS, television broadcasts, websites, and personal notification. A table summarizing the recommendations is shown below in Table 2.

Method of Emergency Communication	Involved Parties	Recommendation
Preparedness	Office of Emergency Services Commissioner	Comprehensive website on emergency preparation
	CFA, MFB	Add information to website specifically addressing Deaf and hard of hearing
	Organizations for the Deaf	Advocate members develop personal emergency plans
	All organizations involved in planning and implementing warning system	Include representatives from Deaf and hard of hearing community in development and testing of system
	Vicdeaf, CFA, MFB	Train emergency responders to communicate with Deaf and hard of hearing people and develop a database of where Deaf and hard of hearing individuals live
Emergency telephone line	Office of Emergency Services Commissioner, Victorian Police	Make all 000 receiving stations TTY compatible
	Australian Government	Enable texting 000 from mobile phones
SMS	Office of Emergency Services Commissioner	Continue to analyze and revise system, paying particular attention to Deaf and hard of hearing
	Organizations capable of sending out warnings	Ensure messages are clear and helpful for Deaf and hard of hearing
Television broadcasts	Television broadcasters, Victorian Government	Mandate and enforce all emergency warnings to be captioned
	Television broadcasters, Victorian Government	Provide interpreter during emergency-related news broadcasts and warnings
Websites and email	Vicdeaf and organizations providing emergency warnings	Keep websites up to date and accessible to Deaf and hard of hearing
	Organizations capable of sending out warnings	Send out emails to subscribers in the case of an emergency
Personal notifications	Organizations for the Deaf	Advocate the formation of personal networks for emergency safety
	CFA	Provide information about individual Fireguard groups on website

Table 2: Summary of Recommendations

5.2.1 Preparedness

The effectiveness of an emergency warning is directly tied to how well people are prepared to receive it. This starts with better education on how to prepare for an emergency

before it happens and what to expect from the Emergency Alert System. Survey results show that 74% of people in Victoria do not know what Emergency Alert is, and 74% of people do not currently have an emergency plan.

In order to increase the preparedness of the Deaf and hard of hearing community, we propose that the **Office of Emergency Services Commissioner provide a comprehensive website that specifically outlines both how the Deaf and hard of hearing population should prepare before an emergency, and what warnings to expect during an emergency.** Although there is the Emergency Alert website⁸ and the CFA website⁹, neither one specifically addresses the Deaf and hard of hearing. By providing a government-sponsored website for the Deaf and hard of hearing (or the disabled in general), all the relevant and specialized information could be put in one place. For example, information pertaining to TTY numbers, government legislation, and questions specific to the Deaf and hard of hearing could be answered. With one centralized location for information, other websites can link directly to this main one. This provides consistency in preparedness information, as well as credibility to the warnings that are sent out. The website could be based on the United States' Disability Preparedness website,¹⁰ since it is in-depth, comprehensive, and provides a broad range of information. Perhaps a less-extensive but easier to implement recommendation is to **provide information on the CFA and MFB websites specifically for the Deaf and hard of hearing.** The CFA website is an especially well-known source of information for bushfires. The important aspect of adding this section, and providing the comprehensive website, is that it pertains specifically to the Deaf and hard of hearing community. Often times, this community may not realize or become personally invested in information if they are not sure it applies to Deaf and hard of hearing people. This comprehensive website and section on the CFA and MFB websites would make it clear what information applies to them and how they should or should not act differently from the hearing population in an emergency. Relevant links such as to the Vicdeaf website should be made from these disability websites provided the linked websites are also accessible.

One of the most difficult parts of implementing these preparedness strategies is motivating individuals to use the resources available to them. The team discovered through the interviews and by talking to members of Vicdeaf that the Deaf and hard of hearing community is

⁸ <http://www.emergencyalert.gov.au/>

⁹ <http://www.cfa.vic.gov.au/index.htm>

¹⁰ <http://www.disabilitypreparedness.gov/index.htm>

more receptive to ideas proposed by people and organizations with whom they are familiar. To aid in the process of educating the Deaf and hard of hearing community, the team recommends that **Vicdeaf and other organizations for the Deaf actively advocate to their members to prepare a personal emergency plan in accordance with provided materials.** In the most advanced manifestation of this recommendation, Vicdeaf would send their members SMS messages, emails, phone calls, and post information on their website at the start of every bushfire season. These would be reminder messages for the community to prepare their house for bushfires and to review their fire safety plans. Vicdeaf could also provide information about Community Meetings and places to get more information, as well as host some Community Meetings at Vicdeaf. Efforts should also be made to utilize social networking resources, such as Deaf clubs, Facebook and Twitter, to raise awareness. Members should be encouraged to join the CFA's "CFA Connect" Facebook page and get the application for their iPhone. This should be done in conjunction with the recent effort to make Auslan and picture versions of fire safety pamphlets, fliers, emails and booklets. Because the information is coming from Vicdeaf, it would raise awareness and validity within the Deaf and hard of hearing community. It could also be modified slightly from the general form of fire safety materials to include the specific problems the Deaf and hard of hearing are likely to encounter. With prominent members and organizations of the Deaf and hard of hearing community advocating emergency preparedness, and with relevant resources in place, the team believes many more Deaf and hard of hearing people will be prepared in the event of an emergency.

Not only is it important for the Deaf and hard of hearing population to be well-prepared, it is also important for the emergency planners to prepare warning systems for use by Deaf and hard of hearing individuals. With many of the warning technologies it is not necessary to develop completely new systems for the Deaf and hard of hearing, but rather just ensure that current technologies are well-suited to the Deaf and hard of hearing's communication needs. For this reason, the team recommends that **organizations involved in the planning and implementation of the emergency warning system include representatives from the Deaf and hard of hearing community in the development and testing of the system.** Primarily, these "organizations" would consist of the Office of Emergency Services Commissioner, MFB, CFA, and Department of Sustainability and Environment, but for emergencies besides bushfires it may include other organizations. With such a complicated and involved system, careful

planning and testing is required to make sure all aspects work properly. By including representatives from the Deaf and hard of hearing community in this planning and testing, the major problematic areas can be identified before a real emergency brings them to light. The most significant resistance likely to be encountered in implementing this recommendation is in getting organizations to take the time and effort to find willing Deaf and hard of hearing representatives to include in their planning. However, research and multiple reports from the US emphasize this as one of the best ways to ensure effectiveness for the disabled (Federal Emergency Management Agency, 2008; National Council on Disability, 2009). The US could be used as a model and perhaps analyzed as part of a cost-benefit analysis. This would show the advantage of including the Deaf and hard of hearing in the planning and testing phase.

As a longer term suggestion, the team recommends that **the CFA and MFB train their emergency responders to communicate with Deaf and hard of hearing individuals, as well as develop a database of where Deaf and hard of hearing people live.** The training could be as simple as ensuring responders had pen and paper to write messages, or having information pre-written out in plain English on note cards. By creating a database of where members of the Deaf and hard of hearing community live, they would know when they respond to an emergency which members in the affected area may still need to be notified of the emergency. The major obstacle with this recommendation is the complexity, time, and cost involved in setting up the training and maintaining the database. An analysis of the usefulness of this approach would have to be done in conjunction with the CFA and MFB to determine the need, resources, and effectiveness of such a plan.

5.2.2 Emergency telephone lines

Several members of the Deaf community that we interviewed suggested that there be an easier way for them to contact emergency services via telephone. In an emergency, it can be hard for a Deaf or hard of hearing person to contact authorities to ask for help or provide information about the emergency.

Although there is the 106 relay number for Deaf and hard of hearing people to call for an emergency, the team recommends **Vicdeaf either research or advocate for the Office of Emergency Services Commissioner to research making all 000 receiving stations TTY compatible.** These 000 stations are being designed and modified to allow a greater number of

callers, and would be a top priority to keep running during an emergency station. Although a properly equipped and staffed relay station for the 106 number would be just as effective, it is an extra step in the communication process, increasing the likelihood of a communications problem during an emergency. Issues with implementation could be addressed by following the US case study, where all 911 receiving stations must be TTY equipped.

Another recommendation that the team generated by conducting interviews was to **enable texting 000 from mobile phones**. However, as of April 20th 2010, this system has been introduced and will be implemented by the Australian Government. Our team recommends that Vicdeaf remains up to date with the advancements in this system, and convey the necessary information to its members as it becomes available.

5.2.3 SMS

Our survey results show that 82% of people in Victoria said that a mobile phone is their preferred method of receiving emergency warnings. Due to this large response, the team believes this particular area of the emergency warning system is worth particular focus. Therefore, even though Victoria made significant advancements to the SMS system after Black Saturday, the team recommends the **Office of Emergency Services Commissioner continue to analyze and revise the SMS system, paying particular attention to its effectiveness for the Deaf and hard of hearing**. As part of these revisions, the team suggests continuing to further investigate the technology of geography-based SMS messages. Current alerts are sent out based on billing address of the phone, which may be very different from the geographic location of the individual.

More specifically, the team recommends that **all organizations responsible for sending out warnings ensure that the messages are clear and helpful for the Deaf and hard of hearing**. Although different organizations are responsible depending on the type of emergency, the team understands that the computer system for sending out the alerts is standardized. Even though there is a protocol for crafting these messages already in place that has been carefully studied, the team believes it is valuable to continually assess the effectiveness of these warnings for the Deaf and hard of hearing. The most effective way of doing this is to include the Deaf and hard of hearing in the planning and testing process of the SMS warnings. For example, Peters and Parremore commented on how the warning they received was not very effective as it

suggested they listen to the radio for more information. It is also important that the Deaf and hard of hearing community is prepared before the text is sent and understand what to do when they receive the warning. Since SMS warnings are limited in the amount of information they can provide, they must work well in conjunction with the other sources of information in place. If they recommend going online or watching television, for example, the websites need to be updated and the television program needs to be captioned.

5.2.4 Television broadcasts

The survey results showed that television broadcasts were the most common method of receiving warnings. As a common medium for receiving news, it is important that these programs are accessible for the Deaf and hard of hearing.

Access to emergency warnings on the news is provided for the hearing population via spoken broadcasts, so it would seem that under the Disability Act of 2006, that same service should be provided for Deaf and hard of hearing people. Thus, the team recommends **enforcing closed captioning for all emergency warnings provided by any television broadcaster**. Although Sky News provides captions for all emergency broadcasts, not every television station does. Based on the interviews, captions would greatly help the Deaf and hard of hearing community access information during an emergency and help remove a lot of confusion. The major obstacle with this recommendation is that it might take a while before all broadcasters are able to provide these captions, but this process could be sped up by referencing the parallel situation in the United States. Another consideration is ensuring captioners are available and ready during an emergency, which could be organized within the captioning company.

The survey also showed that 82% of Deaf and hard of hearing people would benefit from having an interpreter during an emergency broadcast. Although the survey did not determine how many people would *rely* upon an interpreter, even with captioning, this is still a large percentage. Thus, the team recommends **television stations provide an interpreter to sign during emergency-related news broadcasts and warnings**. However, since there may not be a large number of interpreters available during an emergency situation, it might be more practical to select specific television stations, such as ABC, to provide the interpreter. Another possibility for this recommendation would be to have pre-recorded emergency messages that are signed by an interpreter for the most common emergency situations. These could be shown during the news

broadcast in place of a live interpreter. This might be paid for by the government in some cases, but could also be charged to the television broadcasters or provided by an organization for the Deaf.

5.2.5 Websites and email

The websites that provide emergency warnings and safety information can be difficult for a Deaf or hard of hearing person to clearly understand. There is also the issue of trusting how up to date the website is. The survey results show that 34% of respondents have had difficulty with online warnings. Although the team has already recommended a more comprehensive website be provided specifically for the Deaf and hard of hearing, the team recommends that **websites providing emergency warning and recovery information be kept up to date and made more accessible to the Deaf and hard of hearing.** The webmaster should be in charge or delegate someone to keep the webpage up to date during an emergency, and include when the latest information was updated on the website. Ensuring accessibility includes making sure the message is easy to read for those with low-literacy levels, using free accessibility-checker tools found online (such as <http://wave.webaim.org/>), and providing videos of signing whenever possible.

One of the problems with Internet websites is that they require the individual to actively seek out the information. In order to send the information more directly to the Deaf and hard of hearing, the team recommends that **the organization in charge of the emergency (CFA or DSE for bushfires) look into sending out emails to a list of subscribers.** The email list of recipients could be based on an automated registry system. Once the system is in place, people who wanted to receive the email could sign up online and provide their email address. Organizations for the Deaf should then advocate to their members to register their email address. When a warning is sent out to mobile phones, land lines, and broadcast on television and radios, the same message could be sent to the email list. The advantages of email warnings are that they provide one more method of warning people, they are simple to implement, and with the proliferation of Internet-accessible mobile phones, they could be an effective method of providing individuals with a timely warning wherever they are. However, there are many obstacles to this approach. Sending out large amounts of emails requires a lot of bandwidth and could slow down the system. It might also add to a person's false sense of security if the registry

did not explicitly state what it was for and its capabilities. When a person signs up for a registry like this, they could be under the impression that they are guaranteed to receive the warning. Since the system is not fail-safe, they must take responsibility for their own safety and not wait for a warning to be sent to them. In addition, for the high-risk bushfire areas in rural settings, Internet signals may be slow or people may not check their email regularly. This recommendation may be more appropriate for future implementation when Internet speeds and mobile access are faster and more widespread.

The major problem with both Internet warnings and emails is that they require an Internet connection. Internet connectivity might be lost during a serious emergency, or else it might be severely slowed due to high demand. Although emails can be sent to the Deaf and hard of hearing and websites updated, there is no guarantee that someone will log on and see them. Unfortunately these problems are largely unavoidable and inherent in using the Internet.

5.2.6 Personal notifications

Another way to notify the Deaf and hard of hearing of an emergency is through personal contacts. Several of the most common ways of receiving warnings, as identified in the survey, were through family members, friends, and flat mates. Several interviewees and the team's related research brought up the importance of having a personal contact in the event that the other technological methods fail, power goes out, or the other methods are not accessible.

For Deaf or hard of hearing individuals, creating a network of people who will warn them in an emergency is their responsibility. However, the team recommends that **Vicdeaf and other organizations for the Deaf advocate to their members to form personal networks for emergency safety.** This advocacy should be included in the preparedness steps taken by the organization, and facilitated by the organization's networking events. For example, it could be a part of the recommended Community Meetings held at Vicdeaf. After the Community Meeting, Vicdeaf should encourage its members to follow up in one of three ways. First, would be to join a Fireguard group already in place in their neighborhood. This would help a Deaf or hard of hearing person be warned by their hearing neighbor, if, for example, the hearing neighbor had been warned first by the radio. Second, would be to start a Fireguard group in their community by talking with the CFA. Third, if the members preferred to network by interest as well as geography (see Section 4.3.1), a network could be setup within the Deaf and hard of hearing

community. This could be facilitated by Vicdeaf and Deaf clubs in conjunction with the CFA. To aid in the formation and participation of these Fireguard groups, the team recommends that **the CFA provide a list of Fireguard groups, their locations, and contact details on their website**. This way, the Deaf and hard of hearing community as well as the general public know where the groups are and how to get in contact if they are interested in joining. The National Council on Disability (2009) suggests that “family, friends, guardians/caregivers, advocates, agencies, neighbors, workplaces, civic organizations, and faith-based communities” be a part of these networks. If Deaf organizations actively encourage members to form these networks, the Deaf and hard of hearing community will receive advice from a familiar organization, which will most likely generate a stronger response.

5.2.7 Recommendations for future work

Because of the relatively brief time period allotted for this project, the team was unable to exhaust all research opportunities and resources. However, many of these would be beneficial for Vicdeaf and the other organizations involved in the recommendations to use in the implementation of the changes.

The team recommends that **organizations involved in the above recommendations use the two reports found in the US case study (one by the National Council on Disability in 2009, the other by the Federal Emergency Management Agency in 2008) as a guide in implementing the recommended changes**. As the 2008 report was an interim report, reading the final report and any follow up studies would also be helpful. These reports describe in detail the changes and recommendations made in the US with regard to emergency warning messages for the disabled, and are highly relevant and useful to what is currently happening in Australia.

With regard to the recommendations that specifically named an organization responsible for implementing the change, the team did its best to identify the most relevant parties. The team recommends that **Vicdeaf reference the Emergency Management Manual Victoria for questions that arise regarding the hierarchy of responsibility** (Office of the Emergency Services Commissioner, 2010). This document specifically addresses the various organizations and their role in emergency management, as well as provides the structure of the overall emergency management system.

The team also recommends that **Vicdeaf continue to use foreign countries as a source of information in their research, particularly the United Kingdom and the United States.** As countries that have well-structured and advanced systems, they provide useful cases studies and have already done extensive research on many of the warning techniques. Particular attention should be paid to the emerging Common Alerting Protocol, as this seems to be the direction the US, Canada, and international warning systems are going.

Emergency warning systems are extremely complicated and involve a large number of organizations. Therefore, the team recommends that **Vicdeaf research and communicate with all major stakeholders, such as mobile phone service providers, television stations, representatives from the Office of Emergency Services Commissioner, the CFA, and the MFB to gain their opinion on the above recommendations.** Telstra should be contacted with regard to the suggestions made about emergency telephone lines and SMS, since the team was unable to. The Office of Emergency Services Commissioner is important to contact regarding both the structure of the system and the disability rights that mandate some of the changes take place.

The team encountered numerous useful ideas and strategies for improving the effectiveness of emergency warnings for the Deaf and hard of hearing in all aspects of the project. The background research provided breadth and exposure to different styles of systems. The survey gave quantitative data on current opinions and provided insight on what changes would help the greatest number of people. The interviews with the Deaf and hard of hearing provided personalized recommendations, while the interviews with the major stakeholders enabled the team to foresee implementation issues with the recommendations. The above list is a general compilation of those recommendations that the team feels would be the most useful and most plausible to implement, based on the evidence presented earlier in the report. However, a common theme that came up time and again in all areas of the research was the idea that no one method should be exclusively relied upon in an emergency. The recommendations spanned a broad range of warning methods, and the team recommends that **multiple warning methods be made accessible to the Deaf and hard of hearing so there is no reliance on any one method.** Overall, the team believes there is potential to improve the emergency warning system in Victoria for the Deaf and hard of hearing and looks forward to seeing future improvements help make this community safer.

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APPENDIX A: INTERVIEW WITH JANET RICHARDSON

Janet Richardson is the Vice President of Student Affairs at Worcester Polytechnic Institute. The team interviewed her to obtain information about WPI's emergency communication system.

1. Meeting Information

- a. Janet Richardson, Vice President of Student Affairs
- b. Student Affairs Office- 10:00 AM, Friday, February 26, 2010
- c. Sam Kingsley, Jeff Marrion, Kelly Roberge

2. Explain Project

- a. Australia has a lot of bush fires due to drought
- b. People need to be warned of how bad the fires are, where they are, and how they should respond
- c. It is particularly difficult to notify Deaf and hard of hearing

3. Ask how WPI's system works

- a. Use Connect-Ed, a third party vendor
 - i. Connect-Ed started out helping elementary schools and high schools for a wide variety of notifications
 1. Snow day, baseball practice cancelled, etc.
- b. WPI's system Implemented as a result of Virginia Tech shooting
- c. Authorized administrator can log into website
 - i. Create pre-fabricated messages
 - ii. Test system
 - iii. Update people and their contact information
 - iv. Create custom lists (like email aliases)
 - v. Send out alerts
- d. Alerts can be sent out to email, text, phone
 - i. Can pick and choose which technologies
 - ii. Can pick and choose which phone number (emergency contact or not)
 - iii. No problems with different cell phone providers
- e. System gives summary of messages sent out (ex. number of successful calls)
- f. Takes from a few seconds to a few minutes to work

4. Implementation

- a. Takes a few months to implement
- b. Staff training takes a few months
- c. All information stored on an external server
- d. WPI considered other third party vendors besides Connect-Ed
 - i. Decided based on committee of stakeholders
- e. Need to have credible people collecting information and sending alerts
 - i. People feel more comfortable providing personal information
 - ii. Connect-Ed can provide materials needed to persuade “credible people” of effectiveness of system

5. Improvements

- a. System is very user friendly and effective as is
- b. Like any product, improvements are made by the third party vendors to stay ahead of their competitors
 - i. Example: competitor product has GPS capability to find people with cell phone
- c. Need to talk to Connect-Ed about their specific considerations for Deaf and hard of hearing

6. Cost

- a. \$12,500 annual fee

APPENDIX B: INTERVIEW WITH ANNA GAUTHIER

Ms. Gauthier is an American Sign Language interpreter who had prior contact with Vicdeaf. She currently tutors in the U.S. and is friendly with the Melbourne project site director, Holly Ault.

1. Meeting Information
 - a. Phone call between Ms. Gauthier, Sam Kingsley, and Kelly Roberge
 - b. 8:30pm, Wednesday March 3, 2010
2. Experience with Vicdeaf
 - a. Interviewed interpreter department head at Vicdeaf
 - b. Limited experience with the organization; mostly one on one
 - c. Compared Auslan interpreters with ASL interpreters
3. Concerns about interviewing Deaf people
 - a. Working with an interpreter will be a new experience
4. Working with an interpreter
 - a. Keep eye contact with the interviewee and not the interpreter
 - b. There is a lag time between questions and answers
 - c. There is occasionally interpreter error
5. Should/shouldn't be said
 - a. Give the interviewee a lot of information before starting to ask questions
 - b. Explain project
6. Similarities/differences in Deaf culture
 - a. Similarities
 - i. Shared experience in being left out (communication)
 - ii. Both are information oriented
 - b. Difference
 - i. Ask Vicdeaf interpreters (3 or 4) about Auslan Deaf culture
 1. What is acceptable?
 2. What can be viewed as an insult?
 3. Go through the interview questions with them ahead of time
7. Interviews
 - a. Can take notes

- b. One person should be present
- 8. Deaf in the United States
 - a. Scrolling bar at the bottom of televised broadcasts
 - b. The Midwest and South have pager and text warnings of tornados
 - c. There have been many technology advancements
- 9. Deaf in Australia
 - a. Learn a few signs
 - i. Hi, thank you, you're welcome etc.

APPENDIX C: INTERVIEW WITH DAVID PETERS

David Peters is the Information Officer of the Victorian Deaf Society, and is also Deaf. He is very involved with this project, and knows much about Victoria's emergency communications system.

Note: All questions and responses are direct quotes. Questions asked are numbered, and responses given are sub-bullets of the questions.

1. Meeting Information
 - a. David Peters, Information Officer of Victorian Deaf Society
 - b. Vicdeaf Boardroom – 9:40 AM, Friday, March 26, 2010
 - c. Tim Flynn, Sam Kingsley, Jeff Marion, Kelly Roberge
 - d. Two interpreters were present
2. We first wanted to ask you about the current system that's put in place, and what your opinions of it are, and how effective it is?
 - a. Is this in relation to what?
3. All emergency warnings that are being used right now.
 - a. The current system that we have now, I actually don't think it's at a standard where it should be. It's really not good enough.
 - b. And the reasons being: we've never had it in the past and what we've seen is that after an event, things seem to take place rather than before. What we've seen is people being reactive. The fire alarms we have in this building went ahead only because in Tasmania, there was some media where, I think, a Deaf person had a cigarette and slipped and the house burnt down, and there was no alarm. So what we've noticed is that, post-event, things will take place.
 - c. And secondly, in Gibsland, 4 or 5 years ago there were bushfires. And people haven't really taken it seriously.
 - d. And Black Saturday, I think there were a lot of concerns. There was the national SMS warning system that finally came in to play. That I think, black Saturday was the only positive outcome because Deaf community members were receiving SMS warnings but there were complaints in relation to these SMS calls because it

was telling people that there were warnings: please get in contact with ABC radio, and Deaf people didn't really know why. It was just silly things like that, you were getting a warning via SMS and being told to get into contact with or listen to ABC radio. And the Deaf community would find out the day after that the SMS was sent not only to the Deaf community members, it was sent to all mobile phone carriers.

- e. You can see it wasn't specific to Deaf people. In the scheme of things, they haven't set up an appropriate service specifically to tailor for Deaf people in emergency services.
 - f. And I think in the past, there have been major warning announcements on the TV screen, so they would have a news flash, there would be text on the bottom if anything serious that just happened that will come across the screen. So that is a good announcement.
4. So do you think that there needs to be text sent out to the Deaf community with more details, or that the overall message just needs to be better for everyone?
- a. I think for all. I think a better SMS for all people is fine. Part of the community is the Deaf community.
 - b. There's also, you know, access to the Internet, police stations or whatever, making sure Deaf people are aware what's going on and what to do if an emergency takes place.
5. So with the system you have right now, does it change at all based on if there are different types of disasters, or the different severities of the disaster? Are different methods of alerting the communities used, or is it always the same?
- a. Currently, you've got the news flashes coming on the news, and really that's the one consistent thing that we've got on television.
 - b. If there's an incident takes place or if something serious were to happen, say if the Queen were to die, or terrorist attacks, the Port Arthur Massacre that took place, major fire announcements, things like that are the kind of information that you'd get on those news flashes. And that's all there is.

- c. Specific information to Deaf community members? No, there is nothing like that at the moment. CFA and MFB are starting to work on systems like that, but there is no official announcement system in place yet.
6. Can you describe what your experience was like in a previous emergency?
- a. Personally, I haven't had personal experience with being in an emergency situation. Melbourne is more of a low risk area for bushfires, for example.
 - b. My only experience is when I've gone out to regional areas and visited Deaf groups, and I've met many Deaf people who are farmers, working in rural areas. And they've told me of the major concerns that they've always had. And when they tell me that information, they tell me they are lucky they live close to a neighbor who is hearing and they know that I'm a Deaf farmer. And I know that they will always come and assist me if there is some kind of emergency, they will always come and let me know what's going on.
 - c. But then other members of local communities, not farming communities, just don't have that kind of system. I always encourage Deaf people to register their name to their local CFA. Or their local council. To say, "I'm a Deaf person, this is where I live, can you make sure I know what goes on?" So the council or CFA knows that if an emergency is imminent, they can contact this person personally to arrange for that person to be moved, or whatever needs to happen.
 - d. But direct contact doesn't really happen at the moment from emergency services or service providers; it's usually from friends and neighbors if that system's set up.
 - e. Deaf people are always disadvantaged; they're always kind of the last ones to know. For example, when a cyclone is taking place, all the announcements and publicity that was around that, all the hearing people went to the shops to buy their supplies before the hurricanes arrived and filled up their cars with petrol. Deaf people didn't get that information until it was printed in the newspapers, by which time all the supplies have pretty much already run out. So that's another aspect of Deaf people not getting information equally and at the same time as everybody else.
7. How did the hearing people find out about those before the Deaf people?

- a. Radio for example. On the ABC radio. ABC radio is, I believe, the primary radio station that people listen to when there are emergencies imminent. That's where people go because that's the government system. Then there's private radio companies, or commissioned radio stations. They're not the primary ones to get information at, but it's definitely ABC and everyone knows to go to ABC if there's an emergency.
8. What do you think the overall opinion of the Deaf and hard of hearing population is of the current emergency system?
 - a. What system?
9. Just in terms of all the emergency warnings and what's currently put in place.
 - a. Currently, I suppose there are positive and negatives. Sometimes there are fortunate instances where a news flash will bring up information and Deaf people will find that to be very helpful. That may be an early warning system, but that's not effective for everybody. A lot of people don't watch TV.
 - b. The best way to communicate with this kind of information is with SMS. Deaf people have got their phones with them all day and all night. It's a communication device, rather than just a mobile phone. So usually it's in someone's pocket. So as quickly as a hearing person may hear something on the radio, a Deaf person would hear via SMS or capture it via SMS.
 - c. The Deaf community now isn't necessarily completely aware of how to prepare for an emergency. That information hasn't been forthcoming. Melbourne people probably don't really think about it because it is a low risk area, but for people who work in rural areas on farms, they're more prepared than, say, a Melbourne Deaf person about how to get themselves ready in an emergency.
10. So in terms of putting the SMS/texting warnings in place or trying to bring other changes, are there any issues or arguments around that?
 - a. I think that's not only just setting up an SMS system, I think you need to improve the education programs that are in rural areas, evacuation plans. I think the local CFAs need to be able to come to speak to Deaf community members in rural areas as well. And attract Deaf people to those forums that they have, so the Deaf

people are much more aware about what to do, and what those emergencies really are, and what plans they need to make. It's not just about the SMS system.

11. In terms of information being put online, how effective do you think the different websites are? We're aware of the CFA and DSE, but are there other websites that are also providing information?
 - a. There are, yes. That's starting to develop now. The CFA website information is much more effective now that they're getting signing on the videos. They need to have other types of access as well, for example, captioning on these things. Not all Deaf people have proficient signing, particularly older Deafened people. They're not going to be using sign language at all, so they're going to need captions to get information on the screens.
12. In terms of the different websites, do you think they ever have conflicting information?
 - a. It's possible, I haven't seen it. You would need to speak to different government departments. No one's really taken ownership of the issue; everyone's saying "It's their responsibility. No, no, it's their responsibility, it's someone else's." It's about someone taking ownership for this kind of information. You know all the different departments; there's the department of justice, when a bushfire takes places there's the Royal Commission now, there's emergency services.
13. Do you think that a lot of members of the Deaf and hard of hearing community look online? Do they know where to look for these types of warnings?
 - a. I'd say the Deaf community would know if there's risk of bushfire, they'd go to the CFA websites. I think regional Deaf people; country Deaf people would know to do that. No one's going to go to the department of justice's website for information on bushfires, for example; Deaf people understand that they're not responsible for bushfire information.
 - b. My concern is that a lot of the older Deaf people don't have access to the Internet. Now young people are on Facebook and Twitter, but the older Deaf community doesn't do that kind of stuff. But the younger generation definitely has this access to technology. But if you're looking at the older people, and they don't have that; so who's looking out for the older population?
14. What do you think is the best way to reach that older population?

- a. Hmm...through the senior's group that we run here. But that's difficult because Deaf and hard of hearing people aren't always involved in the senior's group. Notifying their local council where they live, that they are a Deaf person, so the council, if there's an emergency, knows where these Deaf people live and where to contact them. I think the council's shouldn't know just about Deaf people, but other disabilities as well. For example, mobility issues, elderly, so it's not just Deaf people that need this kind of assistance.
 - b. A Deaf person, if they know that there's a chance of a bushfire tomorrow, they won't need that kind of assistance. They know, they'll organize themselves, drive themselves out to their escape place. But people with mobility issues may need more direct assistance.
15. So it's more of a face-to-face warning for the older population?
- a. Yeah. I think face-to-face is very important, but in the first place, the council doesn't often know who these people are and where they live. And if they haven't been informed, then the council has no way of knowing who they are or where they're living.
 - b. I think it's encouraging Deaf people, particularly older Deaf people, to let their council know where they are. I don't know how to do that, but maybe that's through annual information that the council receive. Maybe when people are paying their rates, there can be a section that says "Do you have any special needs in an emergency? Are you in a wheelchair, are you a Deaf person?" And a person would just tick a box to inform the council where they are. So the council will know from that.
16. What is the council exactly, is it local, or regional, or country wide?
- a. They're the local branches of government; different from the American system. You have greater Melbourne, which would have maybe 30 different local councils. They're also called shires. What are they called in America?
17. Counties, maybe. A group of several towns.
- a. But then who's responsible for, say, rubbish collection?
18. Each town is.
- a. Ok, so within each town, we have a council that looks out for that sort of thing.

19. In terms of the videos that are put online with interpreters, how widely is that used?
- a. Hmm...it's only really just starting. Personally (I can't speak for all the Deaf community), I'm not always comfortable with the signing that I see. For example, if I get information on paper, I can ignore certain sections of it, and only look at sections I'm interested in and be selective. If you're watching a signed video, you have to watch the whole thing. You don't have the opportunity to speed through it, which you can do if you're using a piece of paper. I can look and see that this paragraph is not important to me, but this one is. I can be selective.
 - b. Having full access in sign language and written form, I think, is very important. I'm comfortable in written form, but a lot of Deaf people aren't comfortable with that, and they're going to need signing versions. So you need to cater to all different segments of the community. Also, don't forget, you've got the oral hard of hearing people who don't understand sign language. So they need to have a written form. People who are native Auslan users can have a choice then.
20. Do you have any idea how difficult, or time-consuming, or how much it costs to provide one of these videos?
- a. Yeah, it kind of depends. Getting a full text video may take up to an hour. You've got editing prices and all that stuff that take place.
 - b. So I think it's very important to provide Deaf people with the education, particularly farmers in rural areas. There are the different fire categories: low risk, medium risk, etc. up to extreme risk and severe risk – with information about what people should be doing in each risk category. I don't know if the Deaf community necessarily understands that. But I think if they did understand that, there'd be less hassle when an SMS warning comes through that lets them know which category of risk it is, because Deaf people know exactly then what to do.
21. We also heard that there are sirens to warn people of an emergency. Would this be effective at all for someone who is partially hard of hearing?
- a. I have no idea.
22. Earlier, you mentioned how there are emergency warnings on TV running across the screen. Is that related to Tele-text, or is that something different?

- a. It's a similar kind of thing as the captioning. Captioning will be a representation of what people are saying on the screen. But the news flashes are just a running line of text on the screen for everybody. It's just a running line of information.
23. So where Tele-text is only offered in the evenings, that can be broadcasted and used at any time?
- a. Yeah, in Australia the government has said that all news programs in the day time must now be captioned. It used to be the case that from 6:00 in the evening until 10:30PM had to have captioning for all channels. But not it's growing and developing, so you're getting midday movies getting captioning as well. It's not a consistent thing, sometimes it happens sometimes it doesn't. But captioning is growing. And that of course only works if you access the page 801 to bring up the captions. But for news flashes, you don't need the captioning system. It pops up on any television screen, so Deaf and hard of hearing people see that information as part of the news broadcast.
24. Is there anything that needs to be done to reach out to Deaf and hard of hearing children? Or do they rely on their parents or school?
- a. I think they will probably rely on their parents and the school systems. Last year, I went to the MFB; they have a lot of school groups. Not Deaf groups specifically, but primary school groups for children who come along and look at the MFB and museum, so they have an education program. I've been there to make sure that they're more Deaf-friendly. So they're providing education to the kids directly.
25. Do you think that the majority of the Deaf and hard of hearing community has an escape plan, or knows how to react if there was a fire or some other emergency?
- a. I believe most of them would, those who are Deaf and hard of hearing. Yeah, they would know. The reason being Deaf people or hard of hearing people are always on high alert. They're using their other senses, like their smelling, so you might need a little bit of training to help them really understand the context of it all. But what things need to be taken before an emergency, what are the priorities, what's necessary. Do I take my medication, or do I take this? Maybe that sort of education would benefit.

26. What do you think are the biggest concerns delaying more improvements from being put in place?
- a. I think the priority for myself and the Deaf community is how you can have direct contact to that person. So once they know, then you wouldn't need to help them any further because they're quite capable. So it's just getting the message to them directly is the main concern.
27. Are there any other organizations in the area that are working to also try and improve their emergency warning system for the Deaf and hard of hearing? And if they are, what are they doing right now?
- a. I think Deaf Australia is. Possibly Victorian Council of Deaf People (Vicod). They may be lobbying.
28. Lobbying for what?
- a. Vicod is an organization that will advocate for its members. So they will lobby for Deaf rights. Vicdeaf is more about welfare. They look at Deaf people who have problems with literacy skills, so it more about supports here at Vicdeaf. And they're more concerned about Deaf people's mental health and wellbeing. But at Vicod, it's more about access for Deaf people; having access to moving, having them captioned.
29. So the overall system right now, there's the radio, the TV broadcasts, and there's an SMS alert. In terms of the Deaf community, there's the SMS alert and the TV, and the websites. But the biggest problem with that is that the SMS alerts are confusing. And there's not the education so the Deaf people understand when they get the alert? Is that correct?
- a. With Black Saturday last year, when a lot of Deaf people received the message for the first time, it wasn't in plain English. It had all this information, and then said to get in contact with ABC radio. So Deaf people thought, that's a silly thing to say. I'm Deaf, why would I get in contact with a radio station? So in the next few days, they found out that the message went to all people, not specific to the Deaf community. It was the first SMS message they've received. I suppose if they've been receiving SMS constantly, they'd be familiar with the system.

- b. What they need is one organization that's run by government, with an SMS register that goes through to this central place. So the Deaf people register, and they know who to contact when there's an emergency. So this SMS that's happening now is for the general population; but what I'm talking about is a message that would go to the Deaf community. So what I'd like to see in place is a central organization, where you can register with them.
30. So in terms of the final result of our project, you would be most interested in focusing on the SMS alerts and that central organization, and how other countries do that register process and how to do it here?
- a. What I'm interested in is, yeah, for you to look at what's happening overseas with regards to emergency services. And someone had mentioned that the system in the UK is good, so why is there such a delay here? And it'd be good to see up to date information from these countries, and this information can be used to lobby government to say "this is where we are at, and this is where we should be."
 - b. But when you question the Deaf community, a lot of the responses will be "I would like it to be by SMS." But the problem is, how would the system work and who would take responsibility to ensure the information gets out to the Deaf community members?
31. So perhaps if we get interviews and surveys back that show all the Deaf and hard of hearing really want the SMS, and then we can show that it's being used currently in foreign countries, then you could use that to lobby and hopefully identify specific branch of your government that would parallel what's currently in place?
- a. Yeah, it's a great tool to use. And just on that, we need access to interpreters. Because in America, they have great access to interpreters. They provide without Deaf people having to request interpreters. But in Australia, it's quite different. If you don't ask, they don't provide. If you ask, the question is who pays for it? But in America, you're provided an interpreter without question. If you're at the airport, they've got TV screen that tell you where the gates are, and they have captioning up top. But here, you have to request that service before anything will take place. No wonder my brothers living in the States love it there.

APPENDIX D: INTERVIEW WITH MICHAEL PARREMORE

Michael Parremore works with the Communications Department of the Victorian Deaf Society, and is also Deaf. He has helped to produce the survey for this project, and is familiar with Victoria's emergency communications system.

Note: All questions and responses are direct quotes. Questions asked are numbered, and responses given are sub-bullets of the questions.

1. Meeting Information

- a. Michael Parremore, works for the Communications Department for the Victorian Deaf Society
 - b. Vicdeaf Break Room – 10 AM, Wednesday, March 30, 2010
 - c. Tim Flynn, Kelly Roberge
 - d. One interpreter was present
2. As you know, we're asking about current emergency communication systems. We were wondering how you usually find out about emergencies?
- a. Now the Victorian Government has a SMS text messaging service so if there is an emergency they will send us a text by SMS on the mobile phone.
 - b. Also, we usually find out by the news on television or the newspaper.
 - c. Sometimes if I'm with friends they might talk to me or just pass on the message that something has happened.
 - d. Or I might receive a SMS from another friend or family member to let me know.
3. Can you describe what your experience was like in a previous emergency?
- a. When I received an emergency text SMS it was actually during the trial period. Even though it was a trial period, I was a little bit anxious when I first got it, but it wasn't until I read the whole message that I realized that it was a pilot trial period so that was okay and I thought it was useful. It wasn't actually a real situation; it was just the government testing that that system was working. So that was useful, but I've never really experienced an emergency situation like that. So, since the bushfires, nothing since then.

4. With this test text, did you get it right away? Did you have your phone on you during the situation? Or did you get it later?
 - a. I was a little bit frustrated with my iPhone because my iPhone doesn't actually vibrate well enough, so sometimes I get text messages and I'm not aware that they're there until a few hours later because of the particular technology I have. The iPhone doesn't vibrate strongly enough. I don't have the ring tone on because I can't hear it obviously so I put it on vibrate, but with the newer iPhones they don't vibrate well enough.
5. So once you read through the whole message, was it easy to understand what they were trying to say?
 - a. Yes, easy for me to understand.
 - b. But what I was frustrated about was they said to listen to the radio for further updates. Ideally if they said could you also refer to our website, that would be useful, but if you're not near a computer, that's not very handy. If I was at a friend's place, or even if I was out playing cricket or in the park, then having a computer at home, I'm not going to be able to refer to the websites, so saying to listen to the radio is not useful for someone like me who is Deaf so that's important in the case of an emergency.
6. Do you think they just need to make the texts more clearly for everyone, or do you think there should be specific texts for the deaf community as well?
 - a. I think it would be good if we had specific texts for the Deaf community. I thought the text I received was clear.
 - b. But I think it's also important that they make sure that the texts that go out are in plain English so they're easy for people to understand. Especially migrants we have here and English isn't their first language.
7. You had said before that you had Deaf friends or family members and you knew about their experiences. Can you tell us a little more about that?
 - a. Yes. I actually interviewed quite a few people about their experiences with the bushfire season that we had. We had two clients that we service here at Vicdeaf whose houses burnt down and they asked Vicdeaf to provide support. I also approached them and asked them if they would share their story and they were

happy to share their story. So I'm happy to talk about it and we actually published it in our newsletter. Would you like me to actually give you a bit of a summary of what they said?

8. Yes, that'd be great.

- a. Alright. There's quite a lot there. One person said that the CFA, the fire authorities, should have a list of Deaf people's address details on their database so they can locate people in terms of where they live, know their street address, so they could actually go around and press on the doorbell. And, particularly if the power is off, for them to have authorization to break into the house and move the Deaf person. So if the fire is there they can exit the premises. That was one suggestion.
- b. Also, Deaf people need to make sure they have contact with their neighbors so that the neighbors can contact them and let them know when they need to get out if the announcement comes on the radio to say that they need to leave their property because there is a bushfire coming. So they thought that was important.
- c. So the emergency SMS or text, they thought that was a good idea. It's good for day time, but not during the night time because if you're asleep the mobile phone isn't always on your bed, or it's on your bedside table. Deaf people generally don't have their mobile phone in bed with them so it's usually on their bedside table. Then they wake up the next morning and they see emergency texts or whatever.
- d. One man said their TTY is out of fashion and their flashing lights are not any good on the TTY phone they use. A lot of Deaf people don't use their TTY phones anymore, their keyboard device, because mobile phones now, with the technology we have, you actually use a TTY type device within the mobile phone. A lot of Deaf people no longer use that TTY machine; it's not very mobile.
- e. Also a Deaf person said they'd like the CFA person to break into their home and warn them rather than knock there and think okay, I'm not getting a response, and then leave the premises and leave that person in the home. A
- f. And another good idea they had was a Deaf person who has a hearing dog would find it useful. Usually you see if the dogs behaving strangely, like if they're

carrying their tail beneath their legs or whatever, they can tell that something's wrong. So, normally by the change in behavior of the dog, they can pick up that a few hours before a bushfire is coming so the animal will pick up that something is happening with its senses and then the person will feel obliged to look further into what's going on. So they suggested a hearing dog, but the dog that they had was not trained, so even their pet dog had picked up on a bushfires somewhere and was acting strangely, so it could tell them that something was going on.

- g. This person talked about how they were grieving because they lost their home and their house burned down and they were stressed about the rebuilding process. They didn't know where to start, having lost their home, and they wanted to find some technology that relates to your research to alert people.
- h. This person is a volunteer who works for the fire brigade providing drink water bottles for people who were volunteering for the fire services. And he said that many Deaf people are better off having contacts with various neighbors so their neighbors can notify them about bushfires that are approaching and they should be able to create their own fire plan with their neighbors. So having something established where they've got a system in place as to how they work with their neighbors if something does happen and the neighbor knows that if a bushfire is coming they need to activate their fire plan and that includes contacting their Deaf next door neighbor.
- i. I mentioned before about the dog noticing something strange, so her dog normally goes out for a run and it stayed inside the whole time. It wasn't until after the fact that she realized that the dog's strange behavior was because it picked up on the fact that a bushfire was approaching. Also, she noticed that there were a lot of cars on the road and a lot of people walking around on the street but she didn't quite know what was going on. It wasn't until she asked someone on the street and they told her. They didn't have all of the information and people had to contact the CFA and find out where all of the fires were and which direction they were coming from at that stage. And then the neighbors told her it was time that they had to go and then all of the cars followed each other out of the street before the fire arrived and burnt down her house. So she lost her house. The neighbor

had to quickly go and grab the Deaf person and let her know to leave and told her to follow all of the neighbor's cars down the street, so by the time that she left it was dark gray color and the whole town went up in flames and her eyes were quite sore from the smoke. And while they were driving down the street they had to drive with their headlights on because they couldn't see anything because of the smoke. She lived in a country town called Flowerdale so they had to leave and travel to the next town Yea. That's Y-E-A. So she had to do that and evacuate her home. I hope that helps.

9. Do you think we could see this newsletter too?
 - a. Yeah, sure. There's other good information in there as well so I can give that to you.
 - b. There's also another story, a guy that I didn't interview, who's from Gippsland, and he's had an experience being involved in bushfires, not only once, but twice, and he's Deaf. Both times the fire approached his home and then went off in different directions because of the wind so there is stuff in the newsletter, I think from last year. So you haven't actually read that?
10. No.
 - a. Okay, I'm happy to give you a copy for you to look at, and I believe that will help your research.
11. Yeah, that'd be great.
12. With the different types of emergency warning methods, are some easier to use than others, and do people have a preference of what they like to use?
 - a. Everybody has different needs so it's hard to target which means or which device is more suitable for most people.
 - b. Some people said ideally if we had like a tower on a hill where we could see a flashing light that would be useful for people.
 - c. Most people have mobile phones, but you can't guarantee that the person will have the mobile phone on them.
 - d. Sometimes some mobile phones are out of range. If you're living in a regional country area you may not receive a signal in some areas, so you might be in that area during the timeframe and may not receive that text SMS. 90% of the time

people have their mobile phones on them. I'm not sure about people who live in the country, so it would be more of a concern for people who live in regional or country remote areas because they have less support, less networking, whereas in metropolitan Melbourne, most people have good networks.

13. In terms of the emergency warnings on your TV, have you ever gotten one of those? Was it clear?

- a. When you talk about the emergency alert on the TV, it was actually quite a fast television advert so it happened rather quickly with all the text down at the bottom. Yeah, I did see that, and when it happened the second time I understood it better. So I think that it took me two or three times to view that before I fully understood what was going on. The first time it was quite weird, there was a lot of visual information on the screen so I didn't really look at the captions the whole time; I was looking at the visual pictures and so on. And then having seen it the second or third time it was clear about the message.

14. Would you also benefit from having an interpreter signing these messages, or is just the text okay?

- a. With this being my perspective, I don't know about other Deaf people, but I'd like to see the captions and the interpreter on the screen. Some Deaf people say that captions are enough, and so people say they only want the interpreter so it's kind of hard. Really it's a matter of preference. I think both of it, the captions and the interpreter, would work well. We have some Deaf clients who don't have proficient literacy skills so they would benefit from using the interpreter, with Auslan being their first language. English is my first language because I grew up speaking orally and learning how to speak; I didn't learn how to sign until I was 22. But then we have Deaf people who have been signing all of their lives who prefer to have the interpreter because it's their first language. But it's interesting because some of those people who are total Auslan users would prefer captioning over the Auslan interpreters, so that's kind of interesting. I think ideally you need to have both.

15. How confident are you that you would be warned in the case of an emergency?

- a. I am very confident that I would receive the message in an emergency situation, but the trouble is how soon will the message come through, I'm not sure. If it was sent two hours ago, it's not until it comes by the satellite two hours later, that can be a problem. I mean, I'm confident I will receive the emergency SMS in that situation, yes.
16. What is your overall opinion of the current system?
- a. I think the system is improving.
 - b. There is still a lot of work that needs to be done, especially in the areas of Deaf awareness. So, the fire volunteers, the fire fighters, the government officials, all the people that are actually involved and also the emergency services people too. I feel like it is improving and Vicdeaf has had some consultation process with those services which is a good place to start.
17. Who in Vicdeaf does that?
- a. David Peters.
 - b. Also my manager, Gavin Belharry, I think he had a meeting with the CFA two days ago actually.
 - c. But most of the time David Peters and the Information Team has.
 - d. Graeme Kelley, the CEO, has been involved too sometimes. You might need to double check.
18. Do you have suggestions of other ways we can make the alerting system better?
- a. It's really tricky thinking about how we can improve things. Basically, the text SMSing is a good place to start.
 - b. Information on the website, because that's clear information, using plain English.
 - c. Possibly having an interpreter sign that on the screen. So not just on the TV, but on the Internet as well, so having the interpreter on the Internet too.
 - d. Having regular updates in the newspaper in one particular area of the newspaper. For example, our main paper is the Herald Sun. If you open the front page, on the left there, if they could have an emergency update in the same specific reference point in the newspaper. Or it could refer to on page four so people know where it is if it's always in the same place rather than a different page every day. If nothing's happening they could still have something there so people could refer to

that and it educates people to refer to the website and check the newspaper. Rather than some days having it there and other day having it on the fifth page, so it's consistently on the same page every day, that would be useful, just so if there's something there people could refer to it.

19. So you live in Victoria?

a. Yes. I live in Victoria, Yeah.

20. How old are you?

a. 35. I had to think about that one, haha.

21. Do you have any other suggestions or comments for us?

a. I think that's probably all. I've told you as much as I could, I think. Would I be able to see you again if something else comes to mind later on down the track?

22. Yes, definitely.

a. Yeah, I think you got everything, but if I talk to the staff and something else comes up or, you know.

23. How are we going to get the newsletters from you?

a. I can provide a PDF in an email or a printed copy.

APPENDIX E: INTERVIEW WITH LOUISA WILLOUGHBY ON FIRE ALARM SUBSIDY

- Meeting information:
 - o Vicdeaf office- 2PM, April 14, 2010
 - o Kelly Roberge
- Although there were many problems trying to get the subsidy started, the actual implementation of it was very spontaneous in Victoria.
- Each system is state funded.
- It comes up periodically, but overall they had been lobbying for 10 years with other Deaf groups.
- Vicdeaf CEO before Graeme Kelly, John Paton casually wrote another letter to the Premier about how it was unfortunate that the Deaf had to pay significantly more for a fire alarm than hearing people did.
- The letter must have been at a good time, but the Premier said yes automatically and then Vicdeaf had to hurry to put together a system.
- Tasmania has more of an ordered process that is backed by the Tasmania Fire Service. They had been lobbying hard for ten years but in November announced that they were also going to have a fire alarm subsidy.
- The fact that Vicdeaf had included the word Auslan in their proposal caused problems regarding who they would be able to provide with fire alarms which basically related to discrimination. Why should only people who use Auslan receive fire alarms when there are Deaf people who do not use Auslan that could benefit just as much from an alarm? It took six months to figure out this issue.
 - o The result was that Vicdeaf provided multiple criteria on how someone could be eligible for a fire alarm. Either proving their fluency in Auslan or proving their hearing loss in dB (medical model).
- No one seemed to be against the subsidy – the only real issue was that it was expensive and there was not money for it.
- Tasmania had a particularly hard time implementing their system because they have a very low tax payer base.

- The Fire Alarm Subsidy scheme is in Victoria, Queensland, South Australia, Tasmania, New South Wales (South Australia had scheme years before Victoria, and Tasmania is more recent)
- It was always clear that the scheme should be government funded but who specifically was going to pay for it was less clear.
 - o Possibly included in home insurance? A tax on everyone?
- It was also clear that whichever department handled disability services should be responsible for the subsidy.
- The main issues raised as they were trying to get the scheme implemented (in addition to money) was how many people were going to be involved in the scheme and if it was worth it or not
- Another issue that was raised was the question on who is eligible to participate in the scheme. There is evidence showing that people with a hearing loss of 60 dB or more will not benefit from a standard fire alarm. However, the Department of Human Services does not want to lower the disability criteria from the current 75 dB cut off because they are afraid of many more people applying and not having enough money
- Victoria is different than other subsidies
 - o In other states and territories fire departments will run the scheme and they will either go install the specialized smoke alarm or have an electrician do it
 - o Vicdeaf just decides who is eligible and then provides a smoke alarm to that person and then they are on their own.
 - Cost is the main factor in this decision
 - Other Deaf populations (such as other states) are more condensed so it is easier to do it with the fire department
 - UK's system is similar to that of other states/territories
- In terms of other similar projects to the fire alarm subsidy and the team's emergency warning system project, other projects typically get grants from foundation
 - o VRI was also a project that was lobbied to the government. That did not need years of convincing. Once the technology was available people were pretty agreeable about the project.
- Overall biggest concerns are money and eligibility

- Similar but smaller project with baby monitors. They only had \$10,000 to buy 20 alarms and there were fights to decide who needed it most.

APPENDIX F: INTERVIEW WITH CFA REPRESENTATIVE

- Meeting information:
 - o Vicdeaf Meeting Room – 4PM, Wednesday, April 28, 2010
 - o Jeff Marrion, Kelly Roberge
- It was a busy week at the CFA with the Royal Commission because the CFA Chief resigned this week.
- CFA gave lots of information to Royal Commission and numerous CFA employees are being called to stand to address issues with Royal Commission Report so Final Report can be better than Interim Report.
- The state government is announcing their budget next week so that makes the week even busier at the CFA.
- People generally understand to go to the CFA website to look for an emergency alert.
- To explain a little bit more about the CFA and what happened up until now
 - o . Up until Black Saturday fires, out of CFA’s operational budget for emergencies about 3% was allocated for community safety which including infrastructure, community engagement, fire management planning, building standards, etc.
 - Very small amount of the 3% that went to community education (a single digit percent) went to disability groups.
 - 5% of one person’s full time position went to multicultural plus disabilities plus seniors.
 - o Although community safety has been talked about for over 20 years no serious action had been taken until recently.
 - o The MFB is lucky because they have high density populations and the community is easier to reach than those in Country Victoria..
 - o
- Before, much more was done in terms of fire prevention instead of community education.
- Not a lot of work done had been done before in terms of education. However, the Black Saturday bushfires have opened a forum for debate.
- Groups, like Vicdeaf, are helping the CFA reach more people by helping to advocating for communities like the hearing impaired. It is unfortunate that it a major catastrophe was the cause of these changes, but it’s good that the system is now being improved.

- It's great that things are being changed, but they are still not where they would like to be.
- She is very interested in our report and seeing what we can contribute.
- She thinks that improving the CFA's website would have been a low priority but could be very important.
- She's working on a bushfire preparedness program.
 - o Developed 42 projects after recommendations from Royal Commission to address the issue
 - o Issue 7.2. Looking at how messages are going out to communities.
 - 8 paragraphs, one about vulnerable communities (elderly, disabled, deaf), and finding ways to reach them.
 - o She is working on identifying who are most vulnerable for bushfires.
 - Both easily identifiable and those who aren't as obviously at risk.
 - Like low social economic groups, drugs, alcohol, single parents, etc.
- She feels that a lot more can be done to improve the system in addition to what is already being done.
- She is working to identify who needs to receive the information, who's not receiving it, and what we can do to help them receive the information.
- She has meetings with Vicdeaf to say 'this is what we currently have. What do you think is relevant to your community? What can we do to make it accessible for them?'
- Preparedness is a huge part of making emergency alerts effective, especially if power is down.
- Although improving emergency alerts is important, from CFA's view, they don't want people to be in a situation where they need to receive an emergency warning in the first place.
- Lots of attention has been put towards how to get an emergency alert out when there is an emergency, and a lots of responsibility put on technology.
- The CFA thinks that people should be educated and understand their environment so they'll already be out of the dangerous situation and won't have to rely on technology to get an emergency warning at the last minute.

- The CFA is trying to address behavior change so people are more proactive in how they respond to potential emergencies. So instead of waiting for an emergency text or phone call, they are aware of the warning and have left before they are in danger.
- Describing the difference between community meetings and fire guard meetings.
 - These meetings had an original framework, but after the Royal Commission came out a lot was changed.
 - Didn't have much choice in some of the changes.
 - More research could have been done before some of the implementation
 - The framework is based on living with fire. It pulls together all of the organizations in Victoria that deal with bushfires.
 - Under framework about preparedness, response, recovery for bushfire.
 - Under that, community engagement aspect.
 - This is what the CFA runs.
 - Within every community you have different levels of people and how they respond.
 - on the top level you have media advertisements, television commercials, radio commercials, state level, government, etc. It deals with the promotion of emergency alert. So the top level is the framework level.
 - The 2nd level has to do with raising awareness. This is where things like Fireready Victoria fits in. This level also deals with putting up posters trying to encourage the people to come to community meetings and get more information. It involves very basic information about bushfire info, the need to have an emergency plan, how to make decisions, and other general stuff.
 - The next level down is for people want to be more engaged and be more prepared. Community fireguard fits in this level. People get together as a group and go through a core process of preparing their homes; how to prepare and what they need. This gets down to the actual preparation of the home. CFA facilitator talks to these

groups, usually formed by neighborhoods. They form telephone tree, engage with each other, help to defend each others' houses, have a plan of a group, pick up each others' kids, figure out when to stay and when to go.

- The level below that is bushfire planning workshops; these are new within last year. These workshops give people info and information on how to be prepared. People don't always actually make a plan, so in these workshops the CFA sits down with them and helps them figure out the details of their emergency plan. Actually put down information on paper. What to do with kids, pets, where you go, how look at weather, etc.
 - Rural areas have something called street corner meetings. Because people don't want to travel far to get information, street corner meetings were created. A presenter from the CFA puts poster up saying what crossroads they are going to be at and at what date and time. They travel around from corner to corner giving presentations. These presentations are great because the presenter can work with local knowledge and can talk about geography, bushes, personal information.
- The CFA is currently having conversations with organizations like Vicdeaf trying to figure out how to better reach people.
 - Lots of Deaf people aren't coming to the CFA meetings so the CFA is now trying to figure out how to reach them.
 - The CFA is identifying those who aren't coming to meetings – like the Deaf, blind, people without transportation – and is trying to figure out how to reach them.
- Part of that could be giving employees vulnerability awareness training.
 - For example, if a Deaf person does show up, ask if you're loud enough or make sure a PA system is available.
- They have learned that people from the Deaf community more likely to work together.
 - This could be an issue with community fireguard.

- People with like minded interest are more likely to want to work with each other. Like Deaf people working with other Deaf people.
 - The CFA would rather have people be engaged in a way that they want to be than force them to be in one that the CFA wants them to be in (with their neighbors).
- Another way CFA has tried to reach the Deaf is that in some bushfire planning workshops they actually have some people sit together to make a plan, so they have had some groups consisting of Deaf people.
- Talked to Vicdeaf about having interpreters be certified to give these meetings too.
 - So instead of the interpreter supporting the CFA person, have a CFA person there to answer questions if necessary and have the interpreter run the meeting.
- People can request a meeting from CFA.
- Another way to reach the Deaf community could be having Vicdeaf have a session about emergency information and have CFA employee give the presentation.
- In the past, many emergency service agencies have been protective of their information, especially if it deals with legislation.. They wanted to make sure they knew who was presenting the information to ensure that it was correct.
- However, they're r it's more important people have the information instead of saying 'go to our website'.
 - Looking into ways to reach out to people including Facebook and YouTube.
 - Trying to figure out what would be the best way to reach people, and not necessarily making sure it's the most official way to present it.
- Have found that with the Deaf community, if it's coming from a resource they're familiar with they are more likely to pay attention to it.
- They are looking to revamp the CFA website, but there are possible concerns with the budget.
- She is receiving a lot of good information from project she's working on.
- Would like to cutout duplicate information on CFA website to make it less confusion.
- Vision Australia did an accessibility check on the CFA's website.
- Government website is looking forward to making their website more accessible.

- One of the issues had was some of the info gotten from government wasn't accessible to everyone
- Needed to be in plain English and the color contrast is important for some
- Because the internet here is slower, there could be issues with items like Auslan videos.
 - o She read research about internet access.
 - o If takes longer than a minute most people won't wait.
 - o Even if people are really interested, if it takes more than 10 minutes almost no one wants to wait.
 - o This is a huge issue. If there are a lot of hits on a website then it will really slow it down.
 - Especially if there are videos during peak usage.
 - Better to have plain English instead.
 - o They have found that people don't want to read the whole ready plan.
 - The CFA took the ready plan information to Vicdeaf, Blind organization, etc. to try to make the information more accessible.
 - They are now putting it in easy English.
 - The CFA is on their 2nd or 3rd draft of putting information into easy English.
 - Its being user tested right now. Brain injuries, cognitive impairments, dyslexia, etc.
- The Emergency Alerts were based on CAP which was user tested so the CFA did not retest the alerts to make sure they were user friendly.
- She is talking to Vicdeaf to help them make sure they are advocating to the right organizations.
- Deaf rely mostly on SMS messages.
- Because it is a new system that's being implemented there are still a lot of questions unanswered.
 - o How far does it reach?
 - o Are there black spots?
- She doesn't have phone access where she lives and that area gets a lot of tourists.
 - o How do tourists receive emergency information?

- The next phase of improvements to the emergency warning system is sending emergency alerts to mobile phones based on geographic location, not billing address.
- Many aren't aware on how to be safe when they're camping.
 - o Advice they give campers is to listen to the radio, but that obviously doesn't reach a Deaf person.
- Should make sure to raise this issue when talking to Deaf community about traveling to high risk areas and the importance of things like registering when they go camping.
 - o Only about 10 – 30 % register with authority. Huge issue for emergency services.
- One of the projects the CFA got from the Royal Commission is looking at people who go to high risk areas.
 - o Looking at tourism and organizations involved with that.
 - o Taking into consideration people with additional needs.
 - o She has sent some of the info they've produced to Vicdeaf so they can help circulate it to the deaf community.
- One issue with an opt in system which are referred to 'people at risk registers', 'vulnerability registers' is that there is no consistency.
 - o Some initiated by police, some by local government, local health service providers.
 - o If you want to go down that line there needs to be very clear to the people what it actually means to have their name on that register.
 - o Some people think that that's all they need to do, but it is still extremely important to be prepared.
 - o It gives many a false sense of security.
 - o If a registry was to be created for the Deaf community, you would need to anticipate a big campaign on what being a part of that registry actually means.
 - Teams of people went in to interview community after the Cain river fires of December 16th to see how the new systems are doing.
 - They interviewed the community to see what they actually did.
 - A massive percentage of the community waiting on the alert.
 - Even though smoke on the air and media was telling them, they were waiting for the phone call telling them when to leave.

- Vicdeaf maybe not be an emergency warning organization, but maybe send out preparation messages ahead of time that could be checked by CFA or MFB. Help to make sure people are prepared but not emergency related. This is a great idea and sounds like something Vicdeaf could do without legal ramifications if their warnings did not get out in time.
- Peoples actions should be based on weather and other information; people should wait for emergency alerts.
 - For example, if someone was near a chemical spill and couldn't be prepared then they would need to rely on emergency alerts
 - . People should be more prepared for bushfires..
- She is going up to New South Wales to talk about her project.
 - They are looking into making a national initiative and creating materials that can be used by all of the states.
 - They are looking into multicultural groups specifically and she wants to advocate for the information to be accessible for all audiences.
 - This project might include pamphlets for every month. Info split up into 12 months.
 - For example, they could encourage people to clean up their yards in October when there isn't a lot going.
- There is currently an audit being done to figure out who is actually in a community fireguard group.
 - The Royal Commission scrutinized their groups because some people claimed that part of their problems with the previous bushfires came from being a part of the firegroup.
 - Records say massive amount of people involved, but now it's questioned how well these groups are working.
 - Have the people actually done all of the 4 core units of the program?
 - Have found that some people call themselves a fireguard group without being a part of the CFA warning process.
- She has been talking to Vicdeaf about how to reach the Deaf community.

- Although it cannot be expected for everyone from CFA to know about TTY stuff, etc., they should be able to put someone in contact with the right person.
- At firefighter level their organization is primarily volunteers.
 - o Have 60,000 in 1200 brigades.
 - o Educating them on something new would take like 10 years.
- CFA not involved in evacuating in Victoria but they're looking into that.
- Considering ways to improve communication between CFA and the Deaf community.
 - o Include some type of Deaf training in a CFA employee's initial training?
 - o Or make sure a fire fighter has a notepad and pen to communicate.
 - o In the past they have had nifty gadgets or symbols that are supposed to help them communicate.
 - Are the kits in every fire truck? Do they know where to find it? Do they know how to use it?
- To make any type of education or training work, it needs to embed it in the organization that its part of its business to be able to communicate with people like this.
 - o Cannot be a onetime training or one person's job.
- CFA just started working on disability action plan.
 - o Employment procedures, infrastructure, community outreach. Gets embedded into their plan.
- Several organizations have capability to send out messages like SMS.
- The CFA has the ability to do it but usually refer it on to someone else.
- She thinks that the SMS message is actually sent out by the Emergency Management Arrangements – whoever is the controlling agency for the incident. Whoever is the most senior control gives the go ahead.
- CFA is currently one of the head organizations for bushfires.
 - o Public property is DSE, CFA is responsible for bushfire on private land.
 - This is causing flack in Royal Commission.
 - Loss of life most critical so thinking final outcome of Royal Commission will be that CFA is going to be more responsible for all not just the private land.

- Some people think it's confusing because if a fire starts in national park and then gets into private land (a town) brings up the question of who's responsible.
- Person who started being in charge of the incident is who was responsible when it started, but there is confusion in the community.
- Even if started in public land, CFA is probably responding anyway.
- They have plantation Brigades.
- One Source One Message project.
 - One of the recommendations from the Interim Report is there should be consistency with messaging.
 - One training package for people sending the messages.
 - One block of information sent out and gets simultaneously distributed to websites CFA, DSE, etc. So that's being developed now.
 - It's has been put in place over the summer.
- We should recommend something to enhance the one source one message to reach everyone.
- Out of what she's doing with the 42 projects, 27 have to do with direct community engagement.
 - She is trying to make sure they're reaching out to disabled groups.
 - If a message going out to all of these websites, it needs to be considered how accessible all of those websites are .
 - One of the Royal Commission Report recommendation is that people could go online and look up workshops/presentations in their area and if there were none they could put in a request.
 - The CFA could then either send out a presenter or if there is only one request they could send out one person to run the workshop or meeting..
 - First these changes are put in place and then look at accessibility.
- Haven't considered emergency alerts via email.
 - Could be problems with filters on computers so it wasn't instantaneous.
 - Partner can send her an email at 9am and she sometimes gets it right away and other times not until 3pm.

- She would be happy to discuss the idea of email warnings further but isn't sure that they would actually work.
 - Email on mobile phone would be good.
 - Emails rely on the fact that people are at their computer.
 - Wouldn't want to encourage for people to check their email regularly if there was a bushfire. They should just leave instead.
- In the country not very many people have internet access.
 - Not a lot of people have it or its really slow.
- Preparedness, preparedness, preparedness. Preparedness is extremely important and should be stressed even more.
- More information could be sent out in the Vicdeaf newsletter.
- Or information could be sent out in a national template.
- She wouldn't feel comfortable telling people to rely on email.
- She has read a lot of the transcripts about the deaths from Black Saturday.
 - Many people waited around checking different resources and calling back and forth.
 - Many waited until it was too late.
 - Most people died 6 - 6:40 pm.
 - They waited for detailed information about when the fire was going to reach their area but there were sudden changes in the fire direction.
- Email could be okay if it was an alert at the lowest level, but not in the case of an urgent emergency.
- Her project is working towards having realistic conversations with people.
 - Bushfires could result in loss of life, it is complex, inconvenient, natural disasters are a pain in the ass, etc.
 - Natural disasters are going to impact everyone to the same degree and it doesn't matter if they are disabled or not.
 - If someone chooses to live independently in high risk area they help people figure out what they need to do.
 - Questions arise on how to deal with people who rely on certain services.
 - Some people need to have a reality check on what's available and realistic.

- For example it might not be the best idea for someone who is 90 years old to be living alone in a bushfire area.
 - The CFA can provide people with everything they can, but at the end of their day it's your decision, it's your risk, etc.
- Her community has asked what's wrong with evacuation.
 - Many of the firefighters are volunteers.
 - She doesn't think it is fair to send them into the face of danger to evacuate someone who didn't prepare themselves.
 - They also should have to go search for some people don't want to be found.
- Community Safety Leaders had a forum last week. Working with Vicdeaf on short videos.
 - Making small clips instead of big ones
 - What to do about barbeques or what to do about driving machinery on a hot day, etc.
- Now that the CFA is working with Vicdeaf, other organizations are starting to advocate more for their groups.
 - –Text versions for people to rely on texts.
 - Being careful of colors for people who are colorblind.
- Having research to back up recommendations is great.

APPENDIX G: INTERVIEWS WITH THE DEAF AND HARD OF HEARING COMMUNITY

Interviews with Vicdeaf seniors group

The team interviewed 8 members of the Deaf and hard of hearing community at one of Vicdeaf's biweekly group meetings for seniors. Unless otherwise noted, all interviewees were Deaf, from Victoria, and use Auslan as a primary form of communication.

Interview 1:

1. Meeting information
 - a. Interviewee is anonymous
 - b. Vicdeaf Break Room – 11:30 AM, Thursday, April 15, 2010
 - c. Tim Flynn, Kelly Roberge
 - d. One interpreter was present
2. Can you describe what your experience was like during a previous emergency?
 - a. Have not been in an emergency
3. Do you think your deaf friends/family members had a similar or different experience to you?
 - a. No
 - b. Two deaf daughters, no emergency though
4. How often do you have the TV on in your home?
 - a. Often
5. Have you ever received an emergency warning on your TV?
 - a. Yes, some.
6. What do you think is the most effective way to reach you in the case of an emergency?
 - a. SMS would be best
 - b. I've always used text with friends to let each other know what's happening

Interview 2:

1. Meeting information
 - a. Interviewee is anonymous

- b. Vicdeaf Break Room – 11:30 AM, Thursday, April 15, 2010
 - c. Tim Flynn, Kelly Roberge
 - d. One interpreter was present
- 2. How do you usually find out about emergencies?
 - a. I recently received test texts from the government on my mobile
- 3. Was it clear, and easy to understand?
 - a. Yeah, for the most part.
- 4. Find out from another way?
 - a. From captioning, or my sisters (have 3 sisters)
 - b. Or Alana (who visits Vicdeaf) lets me know
- 5. Can you describe what your experience was like during a previous emergency?
 - a. Have not experienced an emergency
- 6. Do you ever check websites for emergency alerts?
 - a. I usually get something through email
 - b. Check CFA website
 - c. Mostly mobile and TV alerts though
- 7. What is your overall opinion of the current emergency warnings?
 - a. It's alright, just ok. It needs improvement in Marysville because in a recent fire, they weren't informed quickly, so the messaging system was very slow. In Ferntree gulley, where I live, nothing has really happened, but it is risky.

Interview 3:

- 1. Meeting information
 - a. Interviewee is anonymous, hard of hearing
 - b. Vicdeaf Break Room – 11:30 AM, Thursday, April 15, 2010
 - c. Tim Flynn, Kelly Roberge
 - d. One interpreter was present
- 2. How do you usually find out about emergencies?
 - a. Through husband, news, television, kept close eyes on news, radio, Internet
- 3. What is your overall opinion of the current emergency warnings?
 - a. Ok

4. Do you have a cell phone?
 - a. Yes
5. Texting?
 - a. Yes
6. Do you remember receiving the test for the emergency warning text?
 - a. Yes
7. How quickly did you get it?
 - a. wWll after the fire
8. What do you think is the most effective way to reach you in the case of an emergency?
 - a. Probably by SMS because I usually carry it with me

Interview 4:

1. Meeting information
 - a. Interviewee is anonymous
 - b. Vicdeaf Break Room – 11:30 AM, Thursday, April 15, 2010
 - c. Tim Flynn, Kelly Roberge
 - d. One interpreter was present
2. How do you usually find out about emergencies?
 - a. With my own eyes, I might see something. My husband can hear, so he lets me know. Also from close by neighbors
3. Can you describe what your experience was like during a previous emergency?
 - a. No, but if something happened, I would go somewhere else.
4. Do you remember receiving the test for the emergency warning text?
 - a. No.

Interview 5:

1. Meeting information
 - a. Interviewee is anonymous
 - b. Vicdeaf Break Room – 11:30 AM, Thursday, April 15, 2010
 - c. Tim Flynn, Kelly Roberge

- d. One interpreter was present
- 2. How do you usually find out about emergencies?
 - a. If there's an emergency, I would have to probably TTY Vicdeaf, or the John Pearce Center because SMS and Internet gets out quickly so I can find out from them
- 3. Do you have Internet in your home?
 - a. No, don't need it, I'm too old
- 4. Do you have a cell phone?
 - a. No. Much more peaceful to be without that technology.
- 5. Have you ever received an emergency warning on your TV?
 - a. No, haven't seen any. It should be on TV because you know we don't hear anything, and if there's a fire we wouldn't know where to go. It would have to be large and bold, maybe even a flashing background. Without that, you would think of it as normal captioning
- 6. What do you think is the most effective way to reach you in the case of an emergency?
 - a. It can't be a volunteer system, it has to be organized. Need to make sure nurses in nursing homes are alerted too, so they can inform others, especially the elderly

Interview 6:

- 1. Meeting information
 - a. Interviewee is anonymous
 - b. Vicdeaf Break Room – 11:30 AM, Thursday, April 15, 2010
 - c. Tim Flynn, Kelly Roberge
 - d. One interpreter was present
- 2. Pre-interview:
 - a. I received fire warnings about fire last year via text. Should have signer on TV, even if it's expensive. It's our native language, so it's easiest. Like RACV, I can text if my car is broken down, or that kind of emergency. I can't ask for an ambulance through text, I would like to. Service provides interpreters for doctors would be a good service. I think all doctors should have texts to make appointments as well. Fax works, but takes a long time, so text is the best means

to contact and be contacted by people. Same with police. NABS might have a link to emergency services. I think something should also be on the TV specifically for the Deaf – fire, flood, anything should be on the TV. If there's a power shortage, we have blackouts at home, so I have no electricity. I would like to be informed by text in that situation.

3. Can you describe what your experience was like during a previous emergency?
 - a. I was walking and had a really shaky arm, like a stroke, had to walk home like that. Felt very stuck. I would like mobile to work for that, couldn't use fax because I was not at home.
4. Do you ever check websites for emergency alerts?
 - a. I have, but I have dial up so it's very slow. More comfortable with text.
5. Have you ever received an emergency warning on your TV?
 - a. No, not that I recall.

Interview 7:

1. Meeting information
 - a. Interviewee is anonymous
 - b. Vicdeaf Break Room – 11:30 AM, Thursday, April 15, 2010
 - c. Tim Flynn, Kelly Roberge
 - d. One interpreter was present
2. Can you describe what your experience was like during a previous emergency?
 - a. No, I try to avoid those situations.
3. What is your overall opinion of the current emergency warnings?
 - a. It could be improved
4. Do you ever check websites for emergency alerts?
 - a. Yeah sometimes
5. Which ones?
 - a. I wouldn't know where to look; I don't really know that much about the Internet. There's a fire brigade at my home, maybe they have a website.
6. Do you remember receiving the test for the emergency warning text?
 - a. Someone else had told me about it, but I didn't get it myself

7. What do you think is the most effective way to reach you in the case of an emergency?
 - a. SMS would be the best, if possible

Interview 8:

1. Meeting information
 - a. Interviewee is anonymous
 - b. Vicdeaf Break Room – 11:30 AM, Thursday, April 15, 2010
 - c. Tim Flynn, Kelly Roberge
 - d. One interpreter was present
2. How do you usually find out about emergencies?
 - a. Never had any happen, but usually through TV
3. What do you think is the most effective way to reach you in the case of an emergency?
 - a. My family would send me a text message.

Interviews with survey respondents

Interviewees were respondents to the survey who said they were willing to come in to discuss the topic further.

Interview 9:

Note: All questions and responses are direct quotes. Questions asked are numbered, and responses given are sub-bullets of the questions.

1. Meeting Information
 - a. Interviewee is anonymous
 - b. Vicdeaf Break Room – 4 PM, Friday, April 14, 2010
 - c. Samantha Kingsley, Kelly Roberge
 - d. One interpreter was present
2. Demographics
 - a. Deaf
 - b. Auslan only
 - c. Age: 25 -34

- d. Victoria
3. In this project we're looking at how the Deaf and hard of hearing are warned that there is an emergency. One of the things that we are doing is interviewing members of the Deaf community to get their opinions of how they are warned and if there are better ways that we can improve the system to warn the Deaf community...So you said you live in Victoria?...What kind of area do you live in?
 - a. I live in a rural area. In country Victoria. In a place called Flowerdale, which was a bushfire affected place.
 4. In the Black Saturday bushfires?
 - a. Yes, in Black Saturday. So at the moment I'm living with my parents in the suburbs.
 5. So you were affected by Black Saturday personally?
 - a. Yes.
 6. Can you tell me a little bit about your experience?
 - a. ...Okay, so my house was in Flowerdale. A couple was staying in my house. They were my friends. They were staying in my house for 3 months. At the same time I was renovating the house, and I was living with my parents. I would travel to Flowerdale on the weekends to do some renovations and then I would travel back home and stay there during the week. But that weekend I stayed in Melbourne because my friends from Queensland had flown in. So I was visiting with them and I had no idea about what was happening in Flowerdale until late that Sunday night. Perhaps 10 o'clock or 11 o'clock? I got a message from the couple that they had escaped and that they had had to evacuate from the fire and I said "What?" I had absolutely no idea. So I turned on the TV, but there was no captioning on the TV It was on the news. There was footage. You could see people milling about and you could see emergency services but there was no captions on the TV so I had no idea what was going on. The next day – and that entire weekend – I just stayed on the internet, looking for information and gathering information until that Tuesday. On Tuesday, that's when I found out my house had been burnt down. So I found out my house was gone 4 days after.
 7. So you found this out when you were in Melbourne?

- a. Yes, I was in Melbourne.
8. How did the couple in your house find out the fire was coming?
 - a. Because they are hearing. That morning, Saturday morning, around 10 o'clock they could feel the wind. They felt the plants because the plants looked different. Usually plant leaves are soft but the plant leaves when brittle. They thought something was going on. Then, around 3 o'clock they could smell smoke....so they went to the CFA and asked "what's going on?" and the CFA recommended that they evacuate. So luckily the couple packed their bags and evacuated. Then at 6 o'clock the fire came and destroyed the house, so it happened 3 hours after they left.
9. So, on the TV while you were watching the news, did they have any words scrolling on the bottom saying what was going on?
 - a. No, there was nothing. Nothing. There were words "Emergency Bushfire" but it didn't say where or what was going on because it was live television. It wasn't until the next day, on Sunday, that they started captioning stuff.
10. Do you remember what TV station you were watching?
 - a. I can't remember.
11. You said you were online checking websites. What websites did you look at?
 - a. There were a few. I was jumping all over the web. The CFA website. The other one was great...it looked like a personal blog page so I wasn't sure if it was factual information because it was like a blog and someone was typing in, updating, and it was so fantastic to get that updated information. It was just a random person's blog and I got information from there, but after that the blog got shut down, but it was brilliant because they did complete updates every 30 minutes. It was fantastic. Luckily I found it. I don't know who it was.
12. Do you have any Deaf friends or family who was affected by Black Saturday?
 - a. Yes, I have one friend who lived close to me in Flowerdale who is Deaf. She lives about 5k away from me which is quite close and she was affected.
13. Did she have similar problems with the TV warnings as you did? How did she find out about Black Saturday?

- a. She was there. She had no idea until the very last minute. Like 20 minutes before when the neighbors were saying “Get out! Get out!” and she said “What?! Pack my bags now? Go now?” So she followed her neighbors in her car. So she was quite lucky that she got out safely because she had no idea that entire day.
14. Does she live alone?
- a. Yes.
15. So there is a new system being put in place where an SMS message would be sent out with a warning and I believe that there was a test run of that. Did you get that message?
- a. Yes
16. Do you remember what it said? Was it unclear? Did it say it was a test?
- a. Oh...um, it was after the bushfires. Perhaps one or two weeks after Black Saturday. I think it was a warning that it was going to be really hot again. So a warning about the weather. I got the message. I thought it was great. I don't know why they didn't do it before.
17. Do you always have your mobile phone on you?
- a. Yes, on me or around me.
18. We have talked to other members of the Deaf community and some of them think that there should be a specific system – a SMS message – sent to the Deaf community. What do you think about that?
- a. Yeah, that's a good idea.
19. Some people said that they received unclear messages and other people said that they received messages that said to listen to the radio for more information.
- a. Oh yeah, yeah, I remember that.
 - b. Perhaps they should just reword it and say something like “please watch TV” or “please check the CFA website for bushfire danger information” or “watch the news for cyclone information”. Just perhaps television or the internet rather than the radio, we can't hear the radio. I mean, some hard of hearing people use the radio and that would suit them, but for completely Deaf people, we don't use the radio.
20. So what do you think is the best way to reach you during an emergency?

- a. I think perhaps using a multitude of systems, not just one way of contacting me. So SMS, the internet, the news, and maybe the CFA.
 - b. The local CFA should have a list of Deaf people who live in their region. So in the middle of the night I'm asleep in bed, I'm obviously not looking at my cell phone, at the internet, at my TV, so how am I going to know there's an emergency at 1 o'clock in the morning? So I need a person to contact me, to come into my house and wake me up, or something like that.
 - c. That's my biggest concern, if there's an emergency in the middle of the night.
21. If there was an emergency in the day are you confident that you would know about it?
- a. Yes.
22. So it's just at night that you're worried?
- a. Yes.
23. You said that the TV warnings weren't captioned, do you think having an interpreter on the TV signing information would help?
- a. Yeah, anything. An interpreter or captioning. Just make sure that it's on if there's an emergency.
 - b. Or sometimes, if captioning isn't possible to occur, perhaps the channel – channels 9, 10 or 7, the news channels – could put up a subtitle saying “This is an emergency. For Deaf or hard of hearing people, please contact such and such”.
 - c. Sometimes the captions don't work or they fail or something.
24. So that would be on the screen scrolling across the bottom or something?
- a. Yes.
25. You said that captioning doesn't always work. Are some channels worse than others? Or is it the whole thing in general?
- a. It's a variety. It depends. In the emergency there wasn't any captioning and I thought “Why isn't it subtitled?” It was really frustrating.
 - b. So I asked my Mum, who's Deaf, she can't hear but she can lip-read. Do I rely on my Deaf Mum? And she's lip-reading and saying “Kingslake?” And I said “Are you sure?” And she said “Yeah, I think?”
26. On your survey you said that in addition to the TV and captioning, you also had problems getting messages on your phone?

- a. Yes. I put that in the survey because I was just thinking, if a bushfire occurred, the antennas won't work. The satellites antenna and towers, reception, they don't work. So I wouldn't get an SMSs if I was in the middle of the fire. On Black Saturday nothing worked. The electricity didn't work, the antennas, telephones, you didn't get any texts. So how would you get access?
27. So how do you feel about being warned in general? What's your rating of the system?
- a. I'd give it a 3 out of 5? For the current system.
28. So you think there are improvements that can be made?
- a. Subtitling, captioning, yeah.
29. Thank you for coming in, that was a great help to our project.

After the interview, the interviewee expressed that even though there is the need to improve technology, it is more important to improve community outreach – like making sure people have a network with their neighbors – because if technology fails, like it did on Black Saturday, that is what is going to save people, so that is the most important.

Interview 10:

Note: All questions and responses are direct quotes. Questions asked are numbered, and responses given are sub-bullets of the questions.

1. Meeting Information
 - a. Interviewee is anonymous
 - b. Vicdeaf Break Room – 9 AM, Tuesday, April 20, 2010
 - c. Samantha Kingsley, Kelly Roberge
 - d. One interpreter was present
2. Demographics
 - a. Deaf
 - b. Auslan and spoken language
 - c. Age: 35-44
 - d. Victoria

3. We are students from an American University and we're here working with Vicdeaf to evaluate how the Deaf and hard of hearing are warned that there's an emergency and find out improvements that can be made. So this is going to be a short interview, mostly on your opinions of how you're warned...So can you start off by telling me what state or territory you live in?
 - a. In Melbourne, Victoria.
4. How do you usually find out about an emergency?
 - a. Now there's nothing.
 - b. In the past, with the TTY relay service, I knew if there was an emergency I could ring 106 – it was easy.
 - c. With my mobile phone I couldn't ring 000, there's wasn't an SMS number to ring. So how would I respond in an emergency on the mobile phone? I had no way of doing it and I didn't know about it.
 - d. Some people say ring 112 and I didn't know what that was or where it would get me, and I needed an explanation and I got none. I didn't get any information about this.
 - e. On Black Saturday, for example, with the bushfires, the government sent out SMSs and that was good. I received it, but how would I have responded to it? I have no way of responding.
5. Have you ever been in an emergency? How did you find out about Black Saturday besides the SMS? Did you look on TV? Or any websites?
 - a. The paper, television, the internet.
 - b. By word of mouth too...I work under the Department of Sustainability and Environment which is a part of the fire season so when I go to a fire they say "Oh, no, don't go to Alexandra, they have 500 hectares in danger" so it was a huge fire.
 - c. But my wife had no idea though so I was SMSing her and letting her know because she had actually no idea the extent of the fire, and that's what I mean about how we respond.
 - d. If I receive emergency information about a fire, perhaps I have a question about what it means? Is it large? And then I might have some idea, but if it's just only a one way communication, then all I know is that there's a fire.

- e. Okay, the impact on the community – knowing 4 towns are actually burnt down and how many house are burnt and 175 people are killed – now that sort of thing I find out later through the newspaper. On that day I didn't get that information.
- 6. Do you have Deaf friends or family members who have had a similar experience to you?
 - a. Yes
- 7. So they didn't get all the information they wanted and were confused?
 - a. Especially Deaf women who live in the country.
 - b. It's very lucky that this person lives in a community town, a very small community town, and everybody knew that she was Deaf so they were prepared. But on that day she actually didn't know until a neighbor came in and said "Pack your bags now and get out!" and the Deaf person didn't know what was going on and they said "Don't question me. Just do what I say." And of course they didn't know what was going on. The fire was only 2 minutes away at that stage. And the person packed up and asked "Where are we going?" and she just followed her neighbor and she didn't know where on earth she was going and her house actually burnt down to the ground after she left.
 - c. So that part made me think: the mobile phone is good but in an emergency, what good would it actually do?
- 8. And this was a friend?
 - a. She's not a friend but I know of her, in the community.
- 9. Which methods of warning have been easier to use?
 - a. Mobile phone.
 - b. The internet on the mobile phone is good.
 - c. But how often do they update it? That's my question. For example, when I tell you (I'm talking about hearing people)...it's easy for you as a hearing person to turn on the radio and know what's going on. I'm a Deaf person and I don't get that. So for me, I'm not saying it's easy to solve this problem, but the radio and the internet should be the same. Getting on the radio – whatever you hear – should be typed and put on the internet so I'm getting it on my phone at the same time. I don't know that would solve the problem or work but that's one way.

- d. As for the TV, that's a good question. It depends on who has the captions. I had to quickly go through and find one with captions. I really rely on the captions. It doesn't matter if the person is talking, I have no idea. I'm not interested in the face I want to see the writing. Sometimes there's nothing there, they just do a summary and I want it quickly.
 - e. Most Deaf people can't live without mobile phones and that's why with
 - f. me, I have mine with me always.
 - g. Hearing people have a lot of options. You have the radio or the mobile phone or the internet. But me, as a Deaf person, I'm limited; I only have that mobile phone. Of course I do have the TV if it has captions but you have all these other options; a much wider range.
10. So not every station has captioning? Or it's not always on?
- a. It depends on the time of day. To my understanding the TV captions are from 6 or half past 5 to half past 10 in the evening they have to have captions. After half past 10 they don't. If you're luck you'll get them. And it's not a 24 hour 7 day a week service. Some channels put them on, some don't.
11. So what is your overall opinion of emergency warnings in Victoria?
- a. I'd say set up a special phone SMS service. For example, have one number for everyone. A bit similar to your 000, so everyone automatically knows triple zero and knows to ring it. Okay, if they have a question, ring 1-800-blah blah blah blah. As a Deaf person we need to have one number that we can receive an answer to our questions through SMS.
12. So you think the system can be improved.
- a. Yes, it can.
 - b. They could even set it up at Vicdeaf here if there was funding put down from the state or federal government. We could set up a center here, a special system for the Deaf community. It could be here. It doesn't need to be set up in a particularly new area; it could be part of something like this organization. I know everyone always looks at costs. The government will say "Oh, I have to have staff, I have to have a building, I have to have all these on costs, and it's only a very small community, only 5000 people" and we'll say "No, if you have an infrastructure

like the buildings around here, all you need is the money to set up a system and then it will be there.” That’s my opinion anyway.

13. That’s a good idea. So would you benefit from having an interpreter on tv so if the captioning wasn’t working the interpreter would be on the screen interpreting the information?
 - a. Oh yes.
14. Do you think that would help a lot of Deaf people?
 - a. Yes, for an emergency, yes definitely. Okay, what I’m talking about is a special channel, for example, where a Deaf person could put it on and get all of the emergency information through the interpreter, yeah. 24 hours, 7 days a week. And we know that there’s a special channel there for any emergency. For example, you could have an interpreter on TV, and at the same time you could have different languages, like Arabic or Chinese or Vietnamese, and have Auslan at the same time. People could listen to the other languages and watch the Auslan. You could have that on the screen.
15. So what do you think is the most effective way to reach you in an emergency?
 - a. Like I said mobile phone for me. Mobile phone is the best for me.
16. How confident are you that you’d be warned in an emergency? Would you find out right away or not for a little while?
 - a. If you’re talking about now I’d say 50-50. In the future, if they set up a special system, then I would be confident I would get the message, but not at the moment. I’m about 50-50.

Note: After the interview was completed, the interviewee wanted to tell the interviewer about his family. He explained how most of his family is Deaf (including his wife).

Interview 11:

1. Meeting information
 - a. Interviewee is anonymous
 - b. Vicdeaf Board Room – 2:00 PM, Thursday, April 8, 2010
 - c. Sam Kingsley, Kelly Roberge

- d. No interpreter
2. Ideas/suggestions:
- a. Has been working for 10 years to try to get an SMS number for Deaf people but has not gotten anywhere. He has spoken to many of the Deaf organizations that our team has talked to but still has not gotten responses.
 - b. He spoke about Help Roadside (RACV) which is a service you can text if your car breaks down and help is there in a few minutes.
 - c. SMS messages go to a holding bank then to the recipient. So if there is a lot of traffic then it takes a long time. Wants the Victorian government to get a machine to send a text message, without the holding bank, to the registered number. Can be helpful for reasons such as if someone falls. Perth has an SMS alert system. You register your number to avoid prank calls.
 - d. He has no faith in the CFA. His son is a member and he is upset with them because they will not help him start a system for the Deaf. He has been to meetings with the CFA to try to start this system, but they could not help him. He is frustrated because it only costs \$67 to buy the machine and they still cannot help.
 - e. He wants a way to contact officials if he has an emergency through SMS messages.
 - f. He does not have any suggestions, other than SMS on how to reach him better.... although email would be good.
3. Warnings
- a. He has not seen an alert on television and he does not check websites.
 - b. He has his mobile on him at all times. His wife is also Deaf and she does not have the television on till 7 p.m. and he does not check email and Internet till 7:30 p.m. so he thinks his mobile is the best way to receive a warning. He did not get the test SMS message.

Interview 12:

- 1. Meeting information
 - a. Interviewee is anonymous

- b. Videof Board Room – 2:30 PM, Thursday, April 15, 2010
 - c. Sam Kingsley, Kelly Roberge
 - d. No interpreter
2. Demographics
- a. Hard of hearing - wears a cochlear implant
 - b. Spoken language only
 - c. Age: 55-64
 - d. Victoria
3. Warnings
- a. Preferred method of communication is email and mobile phone
 - b. Got the trial SMS message. Should have received it right away because she always has her phone on her. She understood that the message was an alert.
 - c. If she was home by herself she would like to think something would come up on the television. The phone is not of much use, but she would have the mobile phone on.
 - d. She is concerned about being warned if she was home alone. She would need to tell her neighbors to warn her if there was an emergency. She has not discussed this with her neighbors yet.
 - e. She has not heard the warning siren. She said it would have to be pretty close and they are at the CFA stations. There are two CFA stations within six kilometers of her house.
4. Ideas/Suggestions
- a. Does not have any suggestions. There is some system on the telephone where she could call a number and ask a yes or no question and the response is either “yes yes” or “no” and she would be able to tell if the answer was two syllables or one.
 - b. Would be concerned if she were alone in her house if there was a bushfire, would want her neighbors to contact her, has a loud door bell like Big Ben.

Interview 13:

- 1. Meeting information
 - a. Interviewee is anonymous

- b. Videof Board Room – 9:00 AM, Friday, April 23, 2010
 - c. Sam Kingsley, Jeffrey Marrion
 - d. One interpreter was present
2. Demographics
- a. Profoundly Deaf
 - b. Auslan and spoken language
 - c. Age: 45-54
 - d. Victoria
3. Explanation of our project
4. His experience
- a. Past
 - i. Lived in country
 - ii. System was poor
 - iii. Connected to weather report, very hard for him to have awareness of incoming dangers, same for family (hearing)
 - b. Now
 - i. Improved because of better telecommunications
 - 1. GPS, weather reports, technology has improved things because weather reports did not provide much info in the past, now much more in depth
 - ii. Computers give lots of access to information
 - iii. For people who live in fire prone areas, there needs to be good coverage for telecommunications, no black spots.
 - 1. A friend who lives on farm in the Western district of Victoria outside Ballarat, Horsham. If you are in a gully, there is no coverage for mobile phones.
 - iv. Text messaging and phone is most common method
 - 1. Needs to be clear and simple English, not complex, in the past the language has been too bureaucratic
 - v. Different types of bushfires, in the past used term “spot fire” describing a fire that first flares up then new fires jump ahead and around from that one

1. It is necessary for Deaf people to know where those spot fires are on a map so they know if they should evacuate or not
 2. People in country already know which ways to go if they have accurate information about the location of a fire
5. Different ways of being warned
- a. Easiest ways: landline phones (TTY) if he calls fire station through TTY it is picked up immediately, unfortunately TTY is not as prevalent as used to be, which brings in mobile phones. However, he is not sure about the speed of SMS messages
 - b. Most common is mobile phone but TTY would be better if at home, but the mobile would be better if on the run.
 - c. Newspapers are too slow but the information needs to be clear.
 - d. He has used the Internet for alerts,
 - i. His parents live on a farm and they go to the CFA website to check for warnings. They can understand it but he can also check it and notify parents (who are hearing).
 - ii. Personal communication is important
 - iii. "all comes back to communication"
 - e. Television: On Black Saturday, he knew there was a high risk, but did not see any warnings on television. He said that they will not be concerned about closed captioning in an emergency.
 - i. He suggests that there needs to be open captioned so people who do not have captions can see the message.
 - ii. He thinks it would be better to have interpreter from the CFA.
 1. He says not to put the interpreter in a small circle in corner, but put him or her on camera.
 2. It would be easier to see facial expressions and understand the message from the interpreter.
 - f. His overall rating of the system: the changes are new but they should have happened a long time ago. He questions why they did not learn a lesson from the 1984(?) fires sufficiently.

- i. He is interested to see what happens after the Royal Commission completes their research.
- ii. Victoria is working with federal government
 - 1. Problems need to address nationally and he does not think they are doing that at the moment.
 - 2. The system needs to be coordinated nationally, for example if there is an earthquake.
 - 3. The hearing population gets lots of warnings, but the Deaf miss out.
 - 4. He realizes it is not simple but it needs to be done.
- iii. Rates the system a 3 out of 10.
- g. Most effective way to reach him in a bushfire: the CFA or local council might be in touch with him. They could work together to make sure he has the information.
- h. He is satisfied he would get some information
 - i. The fire drills at Vicdeaf have helped. He thinks it is good to have fire drills
- i. He spoke about a software program called Dragon. It is linked to a computer and a person can speak into a microphone and the software changes words to text for other people to read. I-phones can run this software, but possibly in an emergency if someone had an i-phone with Dragon, the police could talk into the phone and then the Deaf person could read what was said.
 - i. It might say go here for safety. He would be satisfied with that. He says that is a good way of alerting
 - ii. For example, last Thursday he was on a train and it stopped., People left and he did not know why. Apparently there had been an announcement but he did not know what it said. Someone had to write it down to him that the train was stopped for 15-20 minutes. If he had Dragon the person could have spoken into the phone or the phone might have been able to pick up the announcement itself.

Interviews with members of the Casey Deaf Club

All interviewees were interviewed at the April meeting of the Casey Deaf Club.

Interview 14:

1. Meeting information
 - a. Interviewee is anonymous
 - b. Casey Deaf Club – 6:00 PM, Friday, April 16, 2010
 - c. Sam Kingsley, Kelly Roberge
 - d. No interpreter
2. Experience in an Emergency
 - a. Two boys lit a match and started a fire about six months ago. Fire everywhere people panicked. Wires were burnt and did not have communication. They caught the boys because some guy took a picture on his phone and showed police.
 - b. She found out on the television with closed captioning, right away. On channel 9.
 - c. There was a helicopter from CFA (I think they were dumping water on the fires). This happened last year in February.
3. Warnings
 - a. Has a mobile phone with SMS. She is not sure if she received the SMS trial message.
 - b. Looks at CFA website for warnings, but does not read that much so she does not check for fire warnings online often.
 - c. The warnings on television are really confusing.
 - d. Best way to reach her would be SMS message
 - e. Would know right away that there was a fire.
4. Current system
 - a. Thinks the emergency system is really bad.
5. Ideas/Suggestions
 - a. Doesn't have any ideas on how to improve the system.
6. Lives in the suburbs.

Interview 15:

1. Meeting information

- a. Interviewee is anonymous
 - b. Casey Deaf Club – 6:15 PM, Friday, April 16, 2010
 - c. Sam Kingsley, Kelly Roberge
 - d. No interpreter
2. Warnings
- a. Did not get the test SMS message
 - b. Has found out about emergency on the television there was a news flash on the bottom. There was a map of Victoria and they tell you where. Used closed captioning to find out on the television.
 - c. Looks at websites for bushfire warnings on hot days or when she leaves her house for camping.
 - i. www.bom.gov.au
 - d. The best way to reach her during emergencies is through SMS
 - e. Has received warnings from family, friends, newspaper, television.
 - f. Has seen warnings on television and computer but never for her area.
3. Ideas/Suggestions
- a. Better SMS and have emails.
 - b. Have to prepare, write down a plan.
 - i. She has an emergency plan.
4. Lives in a country-ish suburb.

Interview 16:

1. Meeting information
 - a. Interviewee is anonymous
 - b. Casey Deaf Club – 6:15 PM, Friday, April 16, 2010
 - c. Sam Kingsley, Kelly Roberge
 - d. No interpreter
2. Warnings
 - a. Find out about warnings from the police.

- b. Her friend from Adelaide got the same SMS message she did and she is from Fern Tree Gully (suburb).
 - c. Has seen warnings on television with text on the bottom
 - d. She can understand the warnings but people with a lower literacy level cannot understand her grandson for example.
 - e. The SMS messages are easy to understand, but other Deaf people might not understand
 - f. Always looks online.
 - g. The television is on all day
 - h. The best way to contact her is through SMS because it is everywhere, what if you are not home?
3. Current System
- a. The system should be better for the deaf and hard of hearing
4. Experience in an Emergency
- a. There was a bushfire in Upper Fern Tree Gulley and the police were on the roads re-directing traffic so she had to take a detour on her way home.
 - b. Has a friend that was in a bushfire. The neighbors notified the friend of the nearby bushfire. They told her that there was no time to pack and they need to leave. She was surprised and confused. She did not know about the bushfire. She drove behind her neighbors to safety. Her house burnt down.

Interview 17:

- 1. Meeting information
 - a. Interviewee is anonymous
 - b. Casey Deaf Club – 6:30 PM, Friday, April 16, 2010
 - c. Sam Kingsley, Kelly Roberge
 - d. No interpreter
- 2. Experience in an Emergency
 - a. Has not been in an emergency
- 3. Warnings

- a. Finds out about emergencies with the television or her family comes to tell her.
 - b. Has a mobile phone with SMS. Received a warning SMS message in February
 - c. Does not look online
 - d. The best way to reach her is by SMS
4. Lives in Boxhill (suburb).

Interview 18:

1. Meeting information
 - a. Interviewee is anonymous
 - b. Casey Deaf Club – 7:00 PM, Friday, April 16, 2010
 - c. Sam Kingsley, Kelly Roberge
 - d. One interpreter was present
2. Warnings
 - a. It is very difficult to find out about emergencies. She is thinking about researching flashing lights, but at the moment she does not have a better way to warn her because she is Deaf and blind. She only has flashing lights that are for the door, the phone, and it is not enough control for her because she needs extra support. It is important.
 - b. EPQ is a pager that will vibrate for different alerts, but she needs something stronger for a fire. She and her husband have vibrating pillows for the doorbell, but if there was a fire they would not know because it does not go off for that.
 - c. She was not affected by Black Saturday. She lives in the suburbs and it is lucky the fire was not near their house. She is worried about being in an emergency when her husband is at work because she cannot read an SMS alert. The pager is not enough.

Interview 19:

1. Meeting information
 - a. Interviewee is anonymous
 - b. Casey Deaf Club – 7:15 PM, Friday, April 16, 2010

- c. Sam Kingsley, Kelly Roberge
 - d. One interpreter was present
2. Warnings
- a. Usually finds out about emergencies by asking people, neighbors. He is in a wonderful community my neighbors are great.
 - b. Has a mobile with SMS
 - c. Has received an SMS message last year on Black Saturday. The message was really difficult. He did not know what the words meant so he asked someone and they told him about Black Saturday.
 - d. Has seen warnings on television. He has captioning on his television and the captioning could be understood.
 - e. Has internet at house, but he has only just began learning how to use it. He is learning but not competent yet. He does not look online for warnings because he is not confident yet.
 - f. He is not sure of the best way to reach him during an emergency.
3. Current System
- a. It is hard to say what he thinks of the warning system right now.
4. Experience in an Emergency
- a. Never been in an emergency
 - b. Does not have friends or family that has been in an emergency.
5. Lives in Ringwood (suburb)

Interview 20:

1. Meeting information
- a. Interviewee is anonymous
 - b. Casey Deaf Club – 7:25 PM, Friday, April 16, 2010
 - c. Sam Kingsley, Kelly Roberge
 - d. One interpreter was present
2. Experience in an Emergency

- a. Has found out about an emergency once. She received a text warning and thought it was brilliant for Deaf people. Deaf people cannot hear the radio so it is better on SMS, if your phone is on.
 - b. Has not been in an emergency situation.
 - c. Does not have Deaf friends or family that has experienced an emergency.
3. Warnings
- a. Got the SMS last year and was not sure exactly how she got it. She deleted it but it was sent out to all the same people on the same day, Black Saturday.
 - b. At first she was not sure what the SMS message was, but then she reread it and talked to her mom about it. Her mom is hearing and she clarified the message. It said that there was a fire and it was spreading. Thought the SMS warning was wonderful.
 - c. She saw a message on the television but it was not very involved and did not have a lot of information. She already knew about the fire but wanted more information like what to do. Deaf people do not have full access to television.
 - d. Has the Internet but does not look online for warnings. She has not thought to do so. If she knew there was an emergency she would probably look now.
 - e. SMS is the best way to reach her during an emergency. If the SMS is not in her pocket, in her bag, or if she was just popping out of the house quickly she would not get it right away.
 - f. If she had the phone she would know of a warning straight away. Has her mobile in her pillow when she goes to bed.
4. Current System
- a. She thinks the system is important. It is good to know when emergencies occur.
5. Lives near the beach.

Interview 21:

1. Meeting information
 - a. Interviewee is anonymous
 - b. Casey Deaf Club – 7:35 PM, Friday, April 16, 2010
 - c. Sam Kingsley, Kelly Roberge

- d. One interpreter was present
2. Experience in an Emergency
 - a. He was in an emergency maybe 20 years ago
 - b. There was a fire. It was training at school and had to escape a fire he had to put the fire out with a hose.
 3. Warnings
 - a. Does not check online for bushfire warnings, not yet.
 - b. Has not received a warnings on SMS
 - c. Has seen a warning on television through captioning. The message on was a little confusing because of big words he did not know.
 - d. Has seen a warning in a newspaper, more last year with Black Saturday.
 - e. The best way to reach him is SMS because he has his phone in his pocket, especially at work. He would know quickly if the message was sent right away.
 4. Current System
 - a. He thinks it a good system
 - b. His cousin is a fireman who works with the CFA
 5. Lives in Werribee, a suburb

Interview 22:

1. Meeting information
 - a. Interviewees are anonymous
 - i. Husband and wife interviewed together
 - ii. They use an older version of Auslan so David Peters interpreted old Auslan to new Auslan for the interpreter.
 - b. Casey Deaf Club – 7:45 PM, Friday, April 16, 2010
 - c. Sam Kingsley, Kelly Roberge
 - d. One interpreter was present
2. Warnings
 - a. Finds out about emergencies through SMS and he saw a fire that was close to his home. It affected the house next door, but they were safe so it was ok.

- b. They have a fax and SMS text but do not have a TTY
 - c. Has not received the test SMS warning message
 - d. Has seen a warning on television
 - i. She did not understand the message. It was hard to understand because she left school when she was 14. She finds it difficult to read captions.
 - ii. She has a problem with her eyes as well so when people sign really fast it is hard so watching an interpreter on television would be too hard to understand because it is too fast.
 - e. Do not have internet
 - f. All of their neighbors know that they are Deaf so they would alert them if there was an emergency. People at the shopping center know them very well so the community would alert them if there was a bushfire.
 - g. Sometimes their fire alarm goes off when the toast burns. He can hear that alarm and there is a light attached to the smoke alarm.
 - i. He was born hearing and then lost it later in life.
3. Experience in an Emergency
- a. Have not been in an emergency
 - b. Do not have deaf friends or family that have been in an emergency
4. Lives in a residential area.

Interview 23:

- 1. Meeting information
 - a. Interviewee is anonymous
 - b. Casey Deaf Club – 8:00 PM, Friday, April 16, 2010
 - c. Sam Kingsley, Kelly Roberge
 - d. One interpreter was present
- 2. Warnings
 - a. Has a mobile and has internet. Does not have a phone at home. If there was a fire an SMS is much better than a TTY message.

- b. Has a smoke alarm without flashing light. She is renting a house and cannot afford a flashing light. She might move again so if she were to stay in one house she would buy a light. She would not hear an alarm but she might smell a fire and hopefully wake up.
 - c. She would probably receive an SMS but has not received an SMS warning before.
 - d. She has not seen a warning on television and she misses seeing the news.
 - e. Does not check online for bushfire warnings
 - f. SMS would be the best way to contact her in an emergency
3. Experience in an Emergency
- a. Has never been in a bushfire
 - b. I know what to do if a fire were to come, has that knowledge its just making a decision to run or ask for help.
4. Ideas/Suggestions
- a. If there is an alarm or a vibrating alarm in her bedroom she would see that there was an fire or a baby crying...that would be important to have.
5. Current System
- a. The system needs to be improved. There needs to be a quick response with an SMS. A succinct message: fire and where it is so you know if it will affect you or not...just a short message so that you know there is a fire coming...something easy for to access.
6. Lives near the beach.

Interview 24:

- 1. Meeting information
 - a. Interviewees are anonymous
 - i. Married couple interviewed together
 - b. Casey Deaf Club – 8:15 PM, Friday, April 16, 2010
 - c. Sam Kingsley, Kelly Roberge
 - d. One interpreter was present
- 2. Warnings

- a. They would smell the fire and would use 106 on the TTY (the emergency number). If there is a fire coming there would be a message through TTY or SMS on mobile phone.
 - b. Has not received the trial SMS message warning.
 - c. She wears a necklace with a button and if she pushes the button a message will be sent. If there is a fire she can press the button and it would call for help.
 - d. Have not seen a warning on television this year. There has not been an emergency in this area.
 - e. Has received an SMS warning. It was a full message and he understood it.
3. Live in suburbs
- a. There are 22 units where they live so someone would alert them that something was happening. They live in town houses...one level.

APPENDIX H: SURVEY QUESTIONS

Emergency Alert Satisfaction Survey

The purpose of this survey is to try to improve Victoria's emergency communication system by understanding the Deaf and hard of hearing community's satisfaction with current emergency warnings in times of bushfire, for example. This survey is completely voluntary and should take about 10-15 minutes to complete. Thank you very much for your participation!

1. Are you Deaf or hard of hearing?
 - a. Yes-Deaf
 - b. Yes-Hard of hearing
 - c. No-Hearing

2. If you are hard of hearing, what is your average hearing level?
 - a. Normal Hearing (0-20 dB)
 - b. Mild hearing loss (21-45 dB)
 - c. Moderate hearing loss (46-60 dB)
 - d. Moderate severe hearing loss (61-75 dB)
 - e. Severe hearing loss (76-90 dB)
 - f. Profound hearing loss (91 dB +)

3. How old are you?
 - a. Under 18
 - b. 18-24
 - c. 25-34
 - d. 35-44
 - e. 45-54
 - f. 55-64
 - g. 65 +

4. What is your communication preference?
 - a. Auslan only
 - b. Auslan and spoken language
 - c. Spoken language only
 - d. Other

5. What state/territory do you live in?
 - a. Australian Capital Territory
 - b. New South Wales
 - c. Northern Territory
 - d. Queensland
 - e. South Australia
 - f. Tasmania
 - g. Victoria
 - h. Western Australia

6. How do you usually find out about emergencies? (Tick all that apply)
- a. Mobile phone
 - b. TV
 - c. Internet
 - d. Vicdeaf Website
 - e. Family member / Flat mate
 - f. Neighbour
 - g. Friend
 - h. Alarm (audio)
 - i. Other
7. What methods worked best? (Tick all that apply)
- a. Mobile phone
 - b. TV
 - c. Internet
 - d. Vicdeaf Website
 - e. Family member/ Flat mate
 - f. Neighbour
 - g. Friend
 - h. Alarm (audio)
 - i. Other

Comments:

8. Which methods had problems? (Tick all that apply)
- a. Mobile phone
 - b. TV
 - c. Internet
 - d. Vicdeaf Website
 - e. Family member/ Flat mate
 - f. Neighbour
 - g. Friend
 - h. Alarm (audio)
 - i. Other

Comments:

9. Do you have a mobile phone?
- a. Yes
 - b. No
10. How often do you have it turned on and with you?
- a. I do not have a mobile phone
 - b. Rarely (0-6 hours)
 - c. Sometimes (6-12 hours)
 - d. Often (12-18 hours)
 - e. Always (18-24 hours)

11. Do you have SMS?
 - a. Yes
 - b. No

12. Do you know what the Australian SMS Emergency Service is?
 - a. Yes
 - b. No

13. Have you registered for it?
 - a. Yes
 - b. No

14. Do you have Internet access in your home?
 - a. Yes
 - b. No

15. During a season of high bushfire risk, how often do you check websites for emergency alerts?
 - a. I do not check websites
 - b. Rarely (once a month or less)
 - c. Sometimes (2-3 times a month)
 - d. Often (2-3 times a week)
 - e. Always (every day)

16. What websites do you use to read about emergency alerts? (Tick all that apply)
 - a. Country Fire Authority (CFA) Website
 - b. Department of Sustainability in the Environment (DSE) Website
 - c. Vicdeaf Website
 - d. Bureau of Meteorology Website
 - e. Other:
 - f. None

17. How many days a week do you have your TV on in the evening?
 - a. I do not have a TV
 - b. 0-2 days
 - c. 3-4 days
 - d. 5-7 days

18. Have you ever seen an emergency warning on your TV?
 - a. Yes
 - b. No
 - c. I do not have a TV

19. Are you confident that you would receive an alert if it was on TV?
 - a. Yes
 - b. No

20. Would you benefit from an interpreter signing during news broadcasts during emergencies?
- Yes
 - No
21. Do you have an emergency management plan (i.e. survival plan)?
- Yes
 - No
22. If you could be alerted in any way, what ONE way would be easiest to receive emergency alerts?
- Mobile phone
 - TV
 - Internet
 - Vicdeaf Website
 - Family member/ Flat mate
 - Neighbour
 - Friend
 - Alarm (audio)
 - Other
23. In response to the Black Saturday bushfires, the State of Victoria has been working to improve the emergency alert system. What is your overall rating of the current alert system where you live?
- Excellent
 - Good
 - Okay
 - Poor
 - Very Poor
24. Do you have suggestions of a better way you could be alerted?
25. If you would be willing to take part in a short (30 minute) interview to help make the emergency alert system better for the Deaf and hard of hearing, please write your email address below:

APPENDIX I: FLYER FOR SURVEY

Would you be notified in the event of an emergency?

**Please help to evaluate Victoria's emergency
communication system for Deaf and hard of
hearing people**

**There is a short survey on the Vicdeaf website
(www.vicdeaf.com.au)**

**A link to the survey can be found on the left of
the page, titled "Emergency Alert Satisfaction
Survey"**

**It would be greatly appreciated if you could
complete this survey**

Thanks for your help!



APPENDIX J: SURVEY RESULTS

Questions:	Responses:
1 Are you Deaf or hard of hearing?	
Yes - Deaf	41
Yes - Hard of hearing	8
No	1
2 If you are hard of hearing, what is your average hearing level?	
Normal Hearing (0-20 dB)	1
Mild hearing loss (21-45 dB)	1
Moderate hearing loss (46-60 dB)	1
Moderate to severe hearing loss (61-75 dB)	4
Severe hearing loss (76-90 dB)	6
Profound hearing loss (91 dB +)	34
3 How old are you?	
Under 18	0
18-24	1
25-34	8
35-44	15
45-54	12
55-64	11
65+	3
4 What is your communication preference?	
Auslan only	21
Auslan and spoken language	25
Spoken language only	4
Other	2
5 What state/territory do you live in?	
Australian Capital Territory	0
New South Wales	0
Northern Territory	0
Queensland	0
South Australia	0
Tasmania	0
Victoria	50
Western Australia	0
6 How do you usually find out about emergencies? (Tick all that apply)	
Mobile phone	30
TV	34
Internet	21
Vicdeaf Website	17
Family member / Flat mate	23
Neighbour	5

Friend	16
Alarm (audio)	1
Newspaper	4
7 What methods worked well for you? (Tick all that apply)	
Mobile phone	29
TV	28
Internet	20
Vicdeaf Website	16
Family member / Flat mate	21
Neighbour	7
Friend	14
Alarm (audio)	0
Newspaper	1
8 What methods had problems with? (Tick all that apply)	
Mobile phone	15
TV	15
Internet	17
Vicdeaf Website	3
Family member / Flat mate	4
Neighbour	6
Friend	3
Alarm (audio)	10
Newspaper	0
9 Do you have a mobile phone?	
Yes	50
No	0
10 How often do you have your mobile phone turned on and with you?	
I do not have a mobile phone	0
Rarely (0-6 hours)	3
Sometimes (6-12 hours)	6
Often (12-18 hours)	12
Always (18-24 hours)	29
11 Do you have SMS?	
Yes	49
No	1
12 Do you know what the Australian SMS Emergency Service is?	
Yes	13
No	37
13 Have you registered for it?	
Yes	2
No	48
14 Do you have internet access in your home?	
Yes	46

No	4
15 During a season of high bushfire risk, how often do you check websites for emergency alerts?	
I do not check websites	23
Rarely (Once a month or less)	7
Sometimes (2-3 times a month)	7
Often (2-3 times a week)	3
Always (every day)	10
16 What websites do you use to read about emergency alerts? (Tick all that apply)	
Country Fire Authority (CFA) Website	18
Department of Sustainability in the Environment (DSE) Website	4
Vicdeaf Website	15
Bureau of Meteorology Website	11
Other	3
None	18
17 How many days a week do you have your TV on in the evening?	
I do not have a TV	1
0-2 days	5
3-4 days	7
5-7 days	37
18 Have you ever seen an emergency warning on your TV?	
Yes	27
No	22
Do not have a TV	1
19 Are you confident that you would receive an alert if it was on TV?	
Yes	19
No	30
20 Would you benefit from an interpreter signing during news broadcasts?	
Yes	41
No	9
21 Do you have an emergency management plan?	
Yes	13
No	37
22 If you could be alerted in any way, what ONE way would be easiest to receive emergency alerts?	
Mobile phone	41
TV	5
Internet	2
Vicdeaf Website	1
Family member / Flat mate	2
Neighbour	2
Friend	1
Alarm (audio)	0
Other	0

23 In response to the Black Saturday bushfires, the State of Victoria has been working to improve the emergency alert system. What is your overall rating of the current alert system where you live?

Excellent	1
Good	7
Okay	19
Poor	14
Very poor	9

APPENDIX K: ONLINE SURVEY

The following is a screenshot showing the link to our survey up on the Vicdeaf website. As shown in the inset, questions were provided in video and text form.

The screenshot shows the Vicdeaf website with a navigation menu at the top: Home, Services, About us, Resources, Employment, Donate to Vicdeaf, Feedback, Contact us. The main content area is divided into sections: Special Announcements, Upcoming Events, and Vicdeaf news. The 'EMERGENCY ALERT SATISFACTION SURVEY' banner is highlighted with a red circle. A red arrow points from this banner to a video player in the inset below.

The inset shows a video player with a play button. Below the video player, a red banner indicates "This Question is mandatory." Below that, the survey question "Q.3 How old are you? *" is displayed with radio button options: Under 18, 18-24, 25-34, 35-44, 45-54, 55-64, 65+. A "Continue" button is at the bottom.

APPENDIX M: INTERVIEW WITH MFB REPRESENTATIVE

- Meeting Information
 - Jeffrey Marrion, Tim Flynn
 - MFB Burnlee- 8:30AM Monday April 19, 2010
- CFA on outskirts
- Local support for deaf
 - Need to be deaf and have other disabilities to have support programs
- Government supports age care (1000 groups)
- CFA went to meetings across branches to develop letters to individuals that they need to be self-aware of the likely hood of a fire, and that the property is as prepared as possible
- Used to just have news on television, without captioning – Kud island
- Does CFA and MFB do same thing? Yes, CFA is outer region, specializes in Bushfires
 - MFB is inner region, does not specialize in bushfires
 - Royal Commission looking at inefficiency of it
- Black Saturday was mayhem, trucks were coming and going every 15 minutes
 - Could only figure out where houses once were by GPS
- London EPC tried getting disabled user group for feedback, not enough responded
- Early warning is crucial that people are prepared early
 - For evacuation, where to go, when
- Who sends out the alerts?
 - Emergency control center = gov, MFB, CFA, etc
 - DHS emergency division – I will send email to the guy that runs it
 - If you're getting an alert, you would have already known that there is a risk
 - Black Saturday, two big fires joined up, making 200KM fire area
 - Not even fire fighter pagers were working, caused chaos
 - New system has yet to be tested, because there haven't been any major fires
 - Warning system failed for everyone, not just deaf, hence royal commission
- Frank
 - Control center at HQ in Melbourne
 - Link up with control units on the scene via radio
 - Control center assists staff on field with information, resources with big events
 - Bushfires, windstorm, factory fires, etc
 - State Coordination Center for BIG events, talks with ECC
 - ECC is MFB specific, SCC is statewide, invoked on major events
 - SCC housed at DSE
 - Where best to find out how Deaf would be alerted?
 - State and commonwealth issue
 - Depends on events – windstorm = bureau of meteorology

- For deaf, should happen at the same time
 - ABC radio / news is Victoria-wide
 - SEWS, NEWS – one was going to send out phone text, other was for mainstream media alerts. First had a siren, to get attention, then the message went out
- So TV and radio are in place, so it's just one system that you hit "go" and everything gets sent out? Yes
 - The agency pays for that service, get numbers through Telstra and Optus database
 - This is a national program, government has access
 - For Deaf, there is NRS
- Have templates for messages now, just fill in gaps and hit send
- Power lines go out hours before fires even get there
- For a system specific for the deaf, question is who would maintain the database, privacy regulations
 - MFB is not allowed to get personal information like phone numbers
 - Vicdeaf would have to maintain on volunteer basis, and use ECC
- Now have DVDs with Auslan and tele-text
- Recommendations must make sure it's not already happening
 - What about people don't have mobiles / SMS
 - If I were deaf, I would want warning at the same time as everyone else
 - Emergency planning should include access for interpreters to go through
 - Prove that the gap exists
 - Victorian State Disability Act
 - Money not an issue
 - A Deaf doctor died in Black Saturday
 - Brochure
- Double check with government / organizations that the point you think they made is right