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# CFA: Brigades Online Usage Analysis

An Interactive Qualifying Project Report  
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## **Abstract**

The goal of this project was to establish recommendations for Country Fire Authority (CFA) of Victoria, Australia, concerning methods to increase the usage of web-based services for their volunteer members. To do this an evaluation of the current members' only website, *Brigades Online*, was done. Telephone and Online surveys were performed to gain insight into possible problems. From research and these surveys, a set of recommendations were created regarding how CFA could optimize the usage of their members' only website.

## **Acknowledgements**

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## **Authorship Page**

Each member of the team helped with designing, administering, and compiling the surveys. Chris Mayo worked with Ron Lashmir to organize the maps, compiled the data into Excel, formulated the pivot tables, wrote the Introduction and parts of the Results, Methodology, Literature Review, and Recommendations sections. Kyle Geder also worked with Ron and the maps, wrote the Methodology, and parts of the Literature Review. Tim Lontz formatted the paper, wrote the Executive Summary and parts of the Literature Review, Introduction, and Results sections. Andy Anderson visited the Port Jefferson Fire Department to interview firefighters and wrote parts of the Introduction, Results, and Recommendations sections. All members of the group participated in two presentations to CSIRO and CFA.

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## **Nomenclature**

CFA - Country Fire Authority

MFBB - Metropolitan Fire Brigades Board

CFBB - Country Fire Brigades Board

TRA - Theory of Reasoned Action

TAM - Technology Acceptance Model

NFPA - National Fire Protection Association

MCVFA - Mass Call and Volunteer Firefighters Association

NVFC - National Volunteer Fire Council

CFD - Carver Fire Department

EMS - Emergency Medical Service

PFD - Pembroke Fire Department

MEU - Mobile Education Units

PJFD - Port Jefferson Fire Department

FIRS - Fire Incident Reporting System

U.S. - United States

USDA - United States D A Forest Service

BOM - Bureau of Meteorology

DSE - Department of Sustainability and Environment.

BOL - *Brigades Online*

## Executive Summary

As one of the world's largest volunteer based emergency services, Country Fire Authority (CFA) requires an effective method for communicating with and uniting its approximate 60,000 volunteers. The Internet, a relatively new technology, was recognized as the most efficient tool for this purpose. In 2001, CFA established *Brigades Online* (BOL) (<http://cfaonline.cfa.vic.gov.au/mycfa/>), a website designed to help communicate updates and provide existing laws and regulations, training records, and general information to its members. With the emergence and evolution of the information era, it is becoming increasingly evident that CFA needs to adapt its site accordingly. As of June 30<sup>th</sup> 2006, 918 brigades had registered with CFA through *Brigades Online*, representing 76% of the total brigades under CFA's jurisdiction. A total of 10,440 volunteers had individually registered for the online site, representing just 18% of the total number of volunteers. The purpose of this research was to identify reasons for the low usage and make recommendations to Country Fire Authority, which will increase usage of *Brigades Online*.

In order to effectively resolve CFA's *Brigades Online* member participation issues, it was necessary to approach this problem systematically. An initial critique of CFA's website was performed recording only basic preliminary reactions, so that later these reactions could be developed into concrete recommendations and then offered to CFA. Comparisons of CFA's site to other similar, fire related websites were then carried out with respect to webpage layouts, features, and overall website design. Sites that were examined included the National Fire Protection Association (NFPA), the Mass Call and Volunteer Firefighters Association (MCVFA), the National Volunteer Fire Council (NVFC), and the Carver Fire Department (CFD). Interviews were conducted with American firefighters from the Pembroke Fire

Department and the Port Jefferson Fire Department to obtain their opinions on CFA's *Brigades Online* section which were then used in the overall analysis.

Analysis of the collected information was done to visualize trends in the data. CFA had various data available for analysis, including demographic studies and what classes of volunteers were already using the site. To add to this an online survey and a telephone survey were conducted. For the telephone survey, a sample size based on the total volunteer population was carefully constructed to represent the demographics of volunteers in Victoria. In order to create the sample size, a demographic study of the entire volunteer population was performed and proportionally reduced to a realistic sample size. For example, since about 18% of the total volunteer population is women, 18% of the sample size should also have been women. The percentages of certain demographics for the entire population were taken and applied to a given sample size of 500 people. Since CFA had limited data available in their volunteer databases, the population was broken into age, region, and gender.

The telephone surveys needed to be developed before they could be administered to the five hundred volunteers. A set of carefully constructed questions was prepared and administered to selected individuals. Consistency was imperative in applying the survey, so the questions were standardized and structured. The questions and offered responses were kept neutral to reduce bias. Specific wording of the questions was kept at a minimum and the meaning of words was clear to limit ambiguity. Much care was used to ensure that only one issue was addressed at a time per question. Also, the offered responses were designed so that the participant fit into a single category, as opposed to falling in between categories. Generally, the questions progressed from general, factual questions to more specific, behavioral, attitudinal and finally, opinion questions. Open-ended questions were included where it was necessary to gain the respondents'



unrestricted opinion. These questions were important in formulating recommendations for improvements to the site. Contingency questions were also included directly following a few dichotomous questions where the previous response needed to be probed further.

The final telephone survey contained twenty-three questions in total and was completed with respect to three criteria: users, non-users and both users and non-users. The questions themselves were divided into groups, which ultimately represented the goals of the survey. To create a logical flow the questions were layered based upon their grouping. The first set of questions categorized the participant based on gender, age, education, region, position in CFA, and frequency in responding to emergencies. The second set of questions established the participant's Internet usage/accessibility based on their access to both a computer and to the Internet, as well as where they have access. The participant's frequency for Internet and *Brigades Online* usage was also established here. The third set of questions was aimed at recording the volunteer's opinion/recommendations of *Brigades Online*. The surveys were ultimately geared at uncovering exactly why the members were or were not using the website.

The results from 266 online surveys were compiled and analyzed in a similar fashion to the phone survey results. Before a comparison and contrast between the two sets of data was completed, an important difference was identified. Namely, the phone surveys represented a demographic picture of volunteers in the entire state of Victoria in a small sample size, but the online surveys failed to accomplish this task. The online surveys could not be considered a representative sample of the volunteers in the state of Victoria because the appropriate region, age, and gender distributions were not met. Some regions were not represented at all, and the majority of volunteers resided in Regions 8 (20%), 14 (18%), and 13 (15%). Therefore, the data was used only in a supplementary, rather than a primary manner. No conclusions or theories

were generated using the online surveys; however, a comparison and contrast of the two sets of data was developed, and recommendations were partially determined using the data gathered from the online surveys.

After analyzing the data collected, a number of conclusions and recommendations were made to County Fire Authority based upon the analysis. The project group only focused on the findings that were common amongst the surveys. Unique opinions were taken into consideration, but not used in the recommendations to CFA.

The first trend that was found was that 40% of all volunteers use *Brigades Online*. This percentage differed from the original information provided by CFA, so the project group probed the results deeper. It was found that the causes for this difference were related to problems with obtaining permission to call certain brigades and inaccuracies with CFA database and answers given during the survey. The results also showed that the majority of *Brigades Online* users were located in urban areas rather than in rural areas. Further analysis showed that volunteers who responded to emergencies frequently (daily or weekly) were most likely to be users. Also, the people with positions that accessed *Brigades Online* most frequently were Captains and Secretaries. These results led to a finding that the rate of *Brigades Online* usage is affected by volunteers' involvement within their brigade and the amount of calls placed to the brigade.

From the analysis, a possible market potential was identified. Results showed that 35% of *Brigades Online* non-users, who have heard of *Brigades Online*, are users of other CFA websites. Results also showed that 60% non-users often use the Internet. These findings indicate that volunteers are using the Internet to access fire related websites, but not *Brigades Online*. In order to address this issue, it was recommended that more personal information be put on the member's only site. More specifically, it was noted that the position of "member" has

a utilization rate of 48% of every other position. In order to address this, the authors recommended that efforts be raised to press more education of *Brigades Online*, as well as efforts towards volunteers that have the most potential growth of usage: frequent Internet users, members, and volunteers who are unaware of *Brigades Online*.

It was also recommended that an overall major renovation affecting all utilities of *Brigades Online* be made. Some supporting reasons are that there has yet to have been any major renovations to the site since its development in 2001, such as personnel updates and website organization. Moreover, there was broad support that it would be useful to improve the ease of use of the website. By making the site more navigable, volunteers would use *Brigades Online* instead of other CFA websites. Also, it was recommended that improvement of the inaccuracy of personal data and training records was needed. This idea, as well as advertising to the market potential group, would increase site usage. It would also provide CFA with the opportunity to market a new and improved website, which would add interest to volunteers who are not using *Brigades Online*.

The Internet users who were not using *Brigades Online* were accessing websites not governed by CFA. The websites that were most frequently used were the Bureau of Meteorology, and the Department of Sustainability and Environment. Moreover, there was a general sense that these sites were used because of superior technology or more useful information. The Bureau of Meteorology is used for weather, while the Department of Sustainability and Environment was visited for its public availability for their maps. The authors recommended that if remodeling were to occur to *Brigades Online*, then additions to the site should be modeled after the success of these two sites. At the very least, links to these websites would be a necessity to increase the knowledge base for volunteers.

Overall potential improvements should be further researched analytically through a follow up survey that includes all common and unique recommendations. Provided with enough interest from volunteers, CFA should implement these recommendations to improve not only site usage, but also general *Brigades Online* improvement as a whole. Also, a revamping of the website would provide CFA with the chance to market a new and improved website adding much needed interest to volunteers who are users and non-users. CFA needs to adapt with changing technology in order to maintain status in an ever-shifting environment.

# 1 Introduction

As one of the world's largest volunteer based emergency services, Country Fire Authority (CFA) requires an effective method for communicating with and uniting its approximate 60,000 volunteers. The Internet, a relatively new technology, was recognized as the most efficient tool for this purpose. In 2001, CFA established *Brigades Online* (<http://cfaonline.cfa.vic.gov.au/mycfa/Show?pageId=home>), a website designed to help communicate updates and provide existing laws and regulations, training records, and general information to its members. With the emergence and evolution of the information era, it is becoming increasingly evident that CFA needs to adapt its site accordingly. Usage on the site is approximately 18% of the volunteer population, making a potentially resourceful tool less useful than it might be. The purpose of this research is to identify reasons for low usage and make recommendations to Country Fire Authority, which will increase usage of *Brigades Online*.

## 1.1 Country Fire Authority

Country Fire Authority, operating in the state of Victoria, Australia is one of the largest volunteer organization systems in the world. According to information provided in the "Joining CFA" section of Country Fire Authority's official website, there are 1,228 fire brigades utilizing approximately 60,000 volunteers to service the 20 operational regions in Victoria ("Joining CFA"). This large system of brigades is well developed and can date its existence to the late nineteenth century, with the passing of the *Fire Brigades Act of 1890* which created two governing boards, the Metropolitan Fire Brigades Board (MFBB) and the Country Fire Brigades Board (CFBB) (History).

The CFBB and the MFBB were initially created to coexist and direct fire brigades based within a sixteen-kilometer radius around the city of Melbourne. Both organizations consisted of more paid positions than volunteer positions. In contrast, the Bush Fire Brigades, formed in 1926 as a result of serious bushfires<sup>1</sup>, consisted entirely of volunteer firefighters and was managed primarily by the State Forests Department. Their ability to provide effective fire protection<sup>2</sup> was limited by the scarce financial support provided by the government (History).

Following the Black Friday fires of 1939, considered at the time to be one of the worst natural bushfires in Australian history, the Royal Commission which followed led to major changes in forest management and fire protection (DSE). Fires in the central and western districts of Victoria in 1944 further stressed the need for a revised fire protection service. On April 2, 1945, legislation was passed to create Country Fire Authority. This new organization was given the responsibility of all land outside the central metropolitan area of Melbourne (CFA).

Since its conception, CFA has evolved into an organized association. Currently, it consists of roughly 58,000 volunteer members, 400 career firefighters, and 700 career support staff. CFA is responsible for monitoring about 2.5 million people residing in over 150,000 km<sup>2</sup> of land in Victoria. This land includes all of the cities, towns and rural sections in Victoria. State and National Parks are the only areas in Victoria not supervised by CFA because both maintain separate fire protection organizations. To effectively monitor such a large area, Victoria has been divided into nine areas and twenty regions. Brigades are capable of responding to a multitude of emergencies ranging from structural fires, bushfires, hazardous

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<sup>1</sup> A bushfire is an uncontrolled fire in the trees and bushes of scrubland. The term bushfire is a regional term contained mainly to Australia. The terms wildfire and bushfire are interchangeable. (EMA)

<sup>2</sup> application of science and engineering principles in saving lives and property from fire

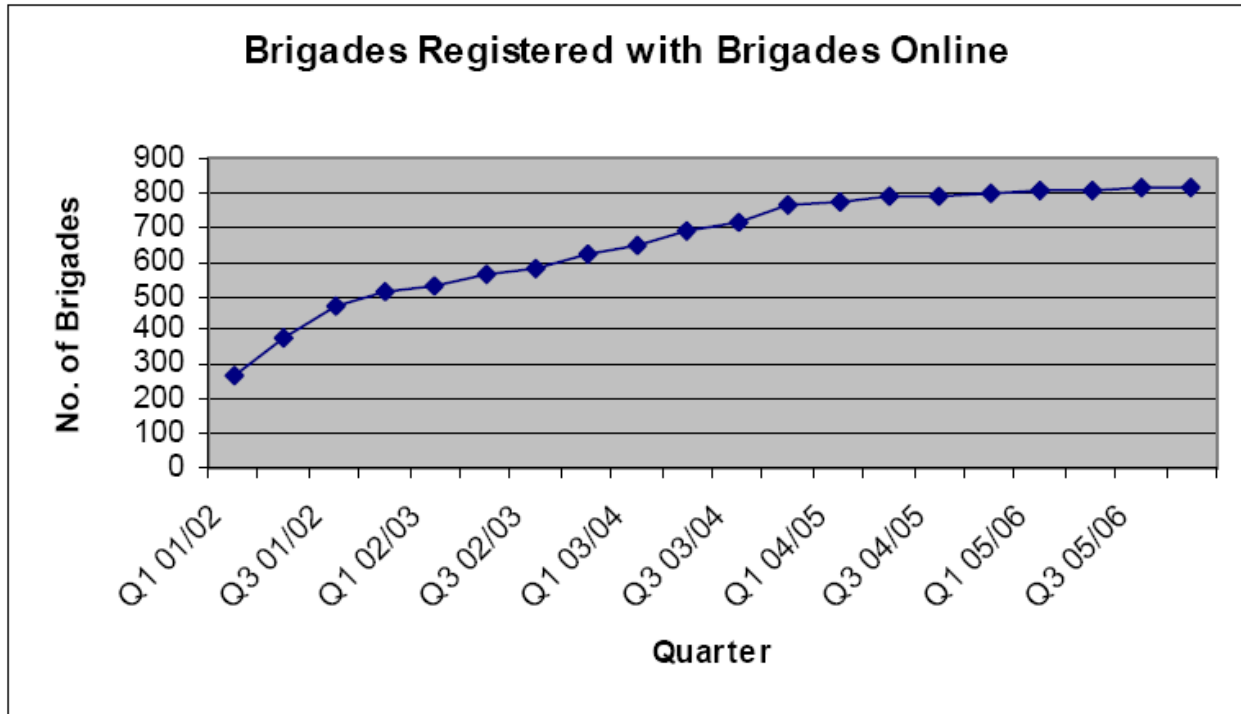
material situations, and urban reach and rescue situations. CFA is involved in community education with the intention to raise awareness of bushfire prevention and precautions.

## **1.2 *Brigades Online***

*Brigades Online*, a sub-section of CFA's main website, was launched in the middle of 2001. It was designed to improve the information management and communication tools for all CFA volunteers. Those who use the site are provided with access to maps, updated laws and regulations, training materials, news, brigade inspection information, contact information for volunteers, a library of CFA documents, fire reports, brigade service and activity reports, and other general information (BRIGADES ONLINE INTRODUCTION).

As of June 30<sup>th</sup> 2006, 918 brigades had registered with CFA through *Brigades Online*, representing 76% of the total brigades under CFA's jurisdiction. A total of 10,440 volunteers had individually registered for the online site, representing just 18% of the total number of volunteers (ONLINE Services).

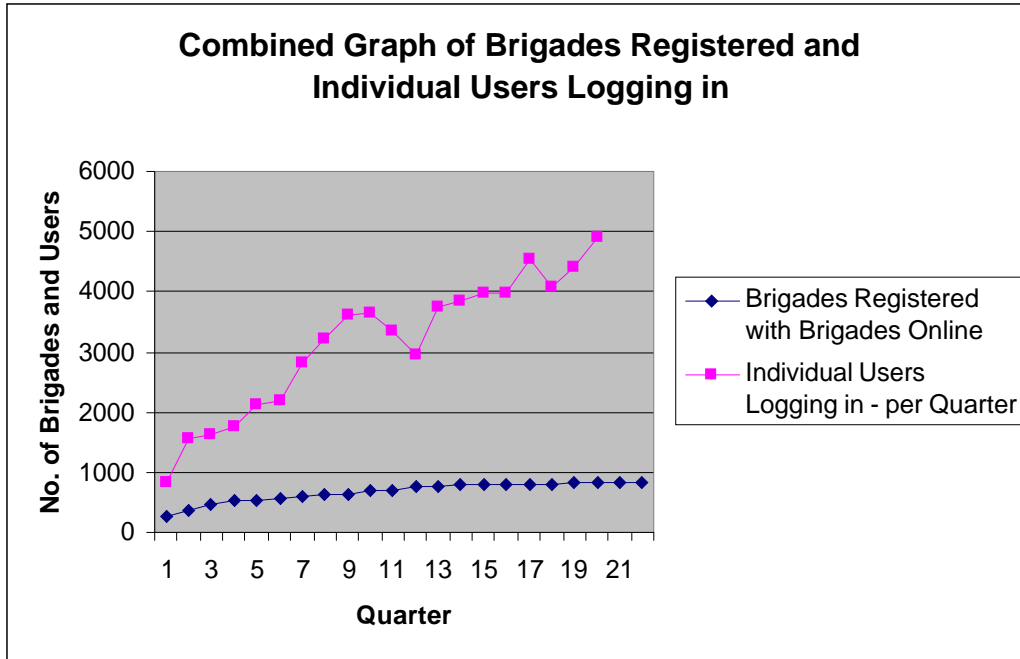
Since the inauguration of *Brigades Online*, the program has continued to grow and develop but has reached an apparent plateau. The increase in registered brigades is shown in Figure 1-1 Registered Brigades Data (ONLINE Services).



**Figure 1-1 Registered Brigades Data**

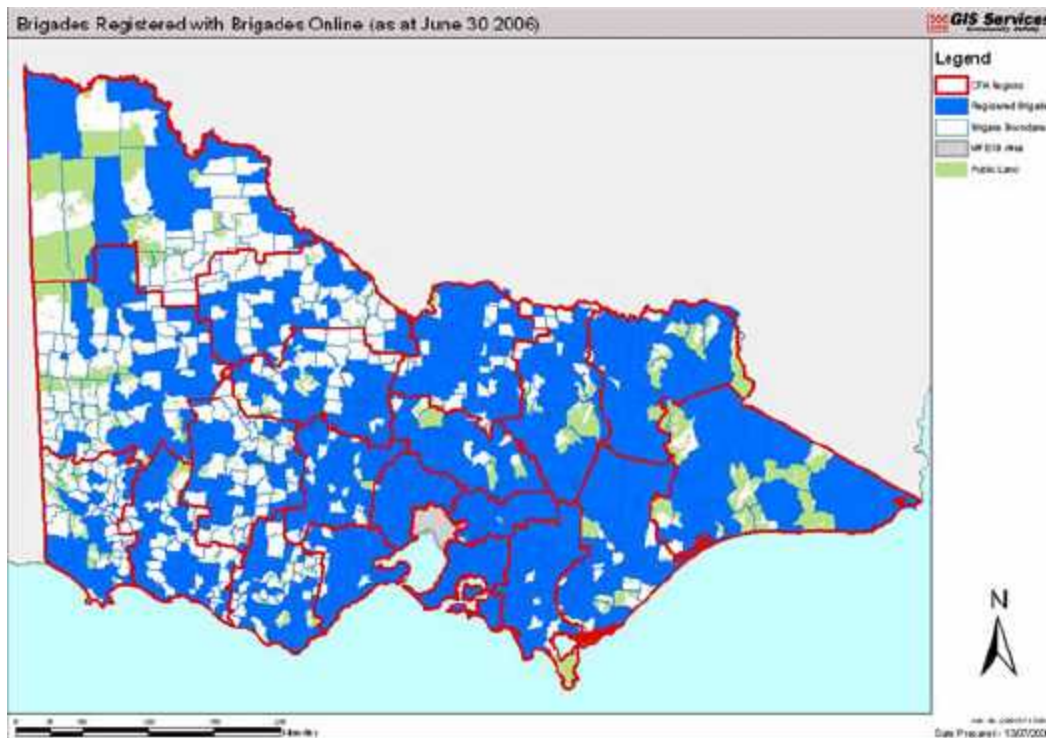
As one might expect, Figure 1-2 Registered Brigades Data and Individual User Log In Data, depicts a trend that is similar to that of Figure 1-1 Registered Brigades Data (ONLINE Services). Both brigade registry and individual usage rose linearly and peaked around 2004. Speculation suggests the initial rise in registration is associated with the introduction of *Brigades Online* and spread of knowledge of the site through the population. This data shows that the site has reached a visible plateau which, according to CFA official Deb Symons, is far below the desired level (Symons). Reasons for the plateau may vary and it is the purpose of this study to deduce them.





**Figure 1-2 Registered Brigades Data and Individual User Log In Data**

Data collected by CFA officials using their online access log can be used to develop a detailed map of brigade access throughout Victoria. The map in Figure 1-3 Map of Registered Brigades depicts the regions of Victoria outlined in red (ONLINE Services). The blue sections indicate areas where brigades have one or more volunteers using *Brigades Online*. White sections show areas where no brigade members are currently using the website. The green sections represent forested areas where there are no CFA brigades. It is also important to note that the white sections tend to represent rural and remote areas of Victoria. Although this map may show relatively strong website usage trends throughout Victoria, it does not paint a definitive picture. One user’s login will turn an entire region blue, which is an inaccurate representation of the usage data. However, the white areas, with no user logins, do help illustrate where there is the least usage.



**Figure 1-3 Map of Registered Brigades**

While this map does not meet the expectations CFA has for the website, the demographic disposition of areas experiencing little or no use, being mainly rural, would suggest such an outcome (Symons). Brigades vary in size and complexity; meaning motives to log in would vary as well. According to Deb Symons, being rural, some brigades likely do not possess the appropriate equipment required for access to *Brigades Online* (Symons). As outlined in a report, it is the goal of CFA to overcome any problems for low usage and reach every brigade and volunteer possible (CFA'S BRIGADES ONLINE - CONTINUING TO GROW).

## 2 Literature Review

The following are descriptions of research pertaining to the topic. Each section contains research and descriptions pertaining only to the title of its section. Research and descriptions are explained in detail.

Research was performed to gain a perspective into the field of psychology. This was important because the volunteer's site usage can be related to psychology. Reports dealing with the psychological reasons for acceptance or rejection of the Internet were of main focus. This field is driven by companies who acknowledge the importance of developing an appealing website and hire the project group to perform studies aimed to discern those aspects that make an appealing website.

Other member-based websites were examined and compared to formulate preliminary ideas on how to improve *Brigades Online*. Several webmasters of these sites were contacted. This proved useful in constructing further recommendations.

Several American volunteer firefighters were contacted and shown *Brigades Online*. Their insight into the site proved useful in discerning those comments which may be received from Australian firefighters.

## **2.1 Psychological Reasons for Acceptance/Rejection**

Previous research in the field of psychology applied to information technology focuses on the user's perceived usefulness, perceived ease of use, and user acceptance of the Internet. The research addresses the issues for which those who work for a company might be motivated to accept and use information technology. Although CFA is a volunteer organization, the concept may still apply. The project group have applied models of previous technology acceptance to the Internet: theory of Reasoned Action (TRA), originally proposed by Fishbein *et. al* (Fishbein and Azjen)., and the Technology Acceptance Model (TAM), proposed by Davis *et. al* (Davis, Bagozzi, and Warshaw). When these models are applied, two theories prevail on the acceptance of Internet technology both of which deal with user gratification and extrinsic and intrinsic motivations. Perceived usefulness, the degree to which a person believes that the use of a

particular system will increase his or her job performance, is thought to be one determinant. The system must be capable of being used advantageously and the user must experience a positive use-performance relationship. CFA is at a disadvantage when compared to corporate entities, as it cannot provide monetary rewards, the gratification part of theory. Perceived ease of use is the second determinant thought to play a major role in technology acceptance. Ease of use is measured as the degree to which a person believes that using a particular system would be free from effort. This concept is a major factor in the use of most web sites (Davis). Previous investigations are useful in developing a strategy for applying TAM to the Internet to help web the project group, developers, and managers understand antecedents to users' decisions to revisit sites relevant to their jobs.

As one would expect, studies find a positive correlation between enjoyment and usage. Task importance is a useful regulator of usage but does not affect enjoyment. Using these studies, one can make predictions on how to make computer programs and web pages more enjoyable while being useful and thus more acceptable (Davis, Bagozzi, and Warshaw).

## **2.2 Examination of Other Member Based Websites**

The examination of other member-based websites was important to establish ideas of improvements that could be made to *Brigades Online*. Sites that were examined include the National Fire Protection Association (NFPA), the Mass Call and Volunteer Firefighters Association (MCVFA), the National Volunteer Fire Council (NVFC), and the Carver Fire Department (CFD).

The NFPA, headquarters located in Quincy, MA, serves as the world's leading promoter of fire prevention and is a powerful source on public safety. The NFPA provides and advocates consensus codes and standards, as well as research, training, and education. Membership totals

more than 79,000 individuals from around the world and more than 80 national trade and professional organizations. Similar to CFA, NFPA's website has an online member's only section (NFPA). This section can be accessed by anyone that pays a membership fee. Benefits of being a member include a 10% discount on all products, continual access to updated codes and standards, continual advice from professional engineers, and a monthly newsletter. Equally, CFA has updated codes and standards accessible through its *Brigades Online* section, with plenty of tech-support from real life engineers. Unlike CFA, the NFPA has 16 industry-specific member sections where members can interact with colleagues from around the world. The NFPA also lets members of good standing use the NFPA logo for personal use such as letterhead and business cards.

Carol Ann Faber, currently the Director of Membership and Continuity Products for the NFPA, was contacted in regards to why the member's section of the NFPA site was created in the first place. She was asked how much online traffic the site gets on a regular basis. She stated, "The members section is primarily for the use of members being able to access codes and standards information from anywhere where they can get Internet access" (Faber). She articulated, "The NFPA has never attempted to track the level of member participation". She did note that when the site was first instituted a login section it did not receive much push back, where usually the site is pretty heavily trafficked every month.

The Massachusetts Call/Volunteer Firefighters Association, or MCVFA, was initially created to promote the well being of call/volunteer firefighters by insuring recognition of vital contributions, increasing awareness of regulatory changes, and by providing a forum to represent c/v firefighters in Massachusetts. Like CFA, the MCVFA has within its website a member's only section designed exclusively for all c/v firefighters (MCVFA). The MCVFA site is

noticeably smaller than that of CFA's; however, there are still some emerging comparisons between the two state organizations. Both sites had updated listings of recent news; however, CFA's site required navigation to this section whereas on the MCVFA website it was the first thing members were presented. The MCVFA site also had a forum section where members could communicate with each other and have discussion on various topics. CFA's site is lacking this capability. The MCVFA site was found easier to navigate than CFA's site; however, CFA's site had far more potential when looking for specific information because it could eventually be found (CFA, MCVFA).

Larry Holmberg, currently the President of the MCVFA, was contacted with the same questions proposed to the NFPA. He explained, "The members section of the site is relatively new, being only a couple of months since its launch" (Holmberg). The member's only section of the site was created to control subject matter from the discussion boards in a frank and earnest manner, which must stay within the organization. He stated, "The reason for this was because subject matter from the discussion board would sometimes get heated and that occasionally warnings were actually given out". Overall, this was really the only reason for the creation of their member's only section (Holmberg).

The National Volunteer Fire Council, or NVFC, is a non-profit membership association that represents the interests of the volunteer fire, Emergency Medical Services (EMS) and rescue services in the United States. The NVFC is made up of 49 state firefighter associations which each appoint a member to serve as the Director from their respective state. Dues vary depending on the level of membership; however, annual averages are around \$500 American. The NVFC is currently under construction of a member's only section of their website (NVFC). Looking at plans for their website can be applied to how CFA's site is already constructed.

The Carver Fire Department, or CFD, is similar to CFA's in the sense both are leading emergency service organizations in fire prevention, fire suppression, and rescue. Both are committed to utilizing and improving the dedication and skills of volunteer members. The CFD and CFA also have mirrored protocols for becoming volunteer firefighters, with a written application and a designated screening period (CFA, CFD). Both websites have a member's only section for volunteers where a login and password is required for access. The CFD site is much simpler than CFA site with less information and resources available, mainly because it is a smaller organization. The CFD site is far more visually appealing with lots of emphasis on pictures and graphic displays. The CFD was easily navigated due to simplicity. It did however have a tracker bar on the side of the webpage, which made it easy to see where the user had browsed from and how to get back to it. This is something CFA's site is lacking that should perhaps, in our opinion, be implemented in the future to ease member navigation.

Chief Craig Weston of the CFD was contacted requesting information about the member's only section of their website. He said, "The website is updated regularly to prevent losing member participation" (Weston). An instant recorder section in which members can listen to online discussions and lectures about fire related issues was just added to the site, as well as a live news feed option that gives users the latest streaming information of local activities. Displayed on the website is also a private picture gallery where members can browse pictures that are withheld from the public. Chief Weston stated, "About  $\frac{3}{4}$  of the members use the member's only section on a regular basis". The site itself is managed internally by some of the more tech-involved firemen. Initially launched in 2003, the member's section requires typically 3-4 hours a week to update using Microsoft Front Page. This site is very successful and CFA

could bring in some of these tactics to improve their own website and get more members actively using it (Weston).

### **2.3 Interviews with American Firefighters**

Interviews with American Firefighters were used in getting outside opinion of *Brigades Online* from firefighters that do not live in Victoria. Various members of the Pembroke Fire Department in Massachusetts (PFD) were interviewed earlier this year to get basic opinions of the site. Opinions were varied. Some firefighters thought the site was easily navigated and well organized, while others felt that it was confusing due to an overload of information upfront. It was felt that because of this surplus of upfront information it discouraged users to explore the rest of the site. If interest still remained to learn more about CFA, it was hard to find the appropriate sections that were being searched for. Some of the more popular features of the site were the online maps showing explicit terrain depiction and area layouts, as well as the available training records for each personal volunteer. Some felt that there were not enough visual displays to attract attention to the site. Mainly the older veterans were less interested in using *Brigades Online*, while the younger firefighters expressed interest that they would probably use the site frequently, but it was not very well organized (PFD).

Fire Chief James Neenan of the PFD was interviewed providing a surplus of interesting feedback about the site. He particularly liked the protocol section that told members what to wear for various occasions. He stated, "I'm always being asked questions regarding what to wear for formal occasions" (Neenan). He also found the mobile education units (MEU) to be particularly helpful regarding what kind of training programs were available to sign up for. He felt the site was particularly useful for in home web browsing. He stated, "It'd be nice to get updated information regarding maps, locations, construction, and street work". He found the site



easily navigated making way through *Brigades Online* for the first time. He felt overall the site was more geared for a higher ranking officer than for the average user. Most of the information found relevant was substance that only would apply to him as the Fire Chief. He provided further constructive criticism, suggesting, “CFA should consider implementing discussion boards, real time news updates, or as close to real time as possible, and maybe a live dispatch section”.

Various members of the Port Jefferson Fire Department in New York (PJFD) were interviewed in December 2006 to get original perceptions on *Brigades Online*. In doing so, many different views of the website were developed. Some felt the website to be very useful and user friendly. While others were discouraged expressing that it was too much information at once. It was felt that because of this surplus of information being presented that perhaps there was a need to reorganize the website (PJFD).

The brigade-to-brigade comparison sections drew favorable attention from the firefighters. While interviewing there were some noticeable trends that formed. It seemed that the more experienced volunteers were more interested in the site than the less experienced volunteers. Adversely to the inexperienced members, the more experienced found information regarding protocol and updates on new devices and standards interesting. They were also interested in the community education sections, thinking that it would be a good way to spread new ideas (PJFD).

Captain Soeren Lygum was interviewed and was very intrigued by the website. He thought that this was a very useful website that would be very helpful to his job. He did note that it was more designed for someone in a similar position to him, being the Captain. He liked the Fire Incident Reporting System (FIRS) section and the ability to obtain new updates and

protocols. He thought that the website was regularly easy to navigate and was not hard to find what he was looking for. One thing that he noted was that in a brigade as diverse as the PJFD, information would be spread to multiple persons, ensuring both responsible for reading and informing the brigade during the weekly meetings. This would keep everyone on the same page and also help him know that everyone is being informed (Lygum).

### **3 Methodology**

In order to effectively resolve CFA's *Brigades Online* member participation issues, it was necessary to approach this problem systematically. An initial critique of CFA's website was performed recording only basic preliminary reactions, so that later these reactions could be developed into concrete recommendations and then offered to CFA. Comparisons of CFA's site to other similar, fire related websites were then carried out with respect to webpage layouts, features, and overall website design. Interviews were conducted with American firefighters to obtain their opinions on CFA's *Brigades Online* section which was then used in the overall analysis.

Analysis of the collected information was important in the visualization of trends in the data. CFA had various data available for analysis, including demographic studies and what classes of volunteers were already using the site. CFA also had records of phone calls about the site. The calls were primarily in regards to members having login and access issues. These data were supplemented by phone surveys of five hundred volunteers as well as online surveys that were completed by users of the site. The sample size of the telephone survey was carefully constructed to accurately represent the actual demographics of volunteers in Victoria. Both the telephone surveys and the online surveys were ultimately geared at uncovering exactly why the members were or were not using the website.

### **3.1 Initial Brigades Online Critique and Website Comparison**

*Brigades Online* was analyzed with respect to three different criteria. First, *Brigades Online* was navigated making note of basic first impressions. First impressions are very important, as noted in the International Journal of Human-Computer Studies: “Recent research suggests that the visual aesthetics of computer interfaces is a strong determinant of users’ satisfaction and pleasure” (Talia Lavie and Noam Tractinsky, Volume 60, Issue 3, March 2004, Pages 269-298). This strategy helped create an idea of what volunteers may think when they first logged in, also dictating the frequency with which they accessed the website. Secondly, *Brigades Online* was compared to other online fire related organizations to see if there were any similarities or dissimilarities that could be used in formulating overall recommendations. This comparison helped to develop an initial conceptual understanding of popular webpage utilities that attracted attention from users and made site navigation more straightforward. Inversely, this helped extend perception of which utilities made web navigation convoluted. Finally, *Brigades Online* was looked at in-depth, navigating the site until a solid understanding of its complexity and potential was reached. Initial and subsequent opinions of *Brigades Online* were then combined with the website comparisons to help formulate overall recommendations even further.

### **3.2 Outside Opinion from American Firefighters**

U.S. Firefighters from Port Jefferson, New York and Pembroke, Massachusetts were interviewed. Each interview consisted of a navigation portion where each firefighter was given access to *Brigades Online* and was told to browse freely, as if they were using it from their own home. Each firefighter browsed to whichever part of the site initially attracted them. Secondly, responses were recorded as to what the firefighter’s first impressions of the site were and if there

was any content on *Brigades Online* that would encourage them to continually log in. The firefighters were then asked a series of questions directed at establishing their overall opinion of the site. After initial observations were recorded, firefighters were asked questions regarding overall likes/dislikes of the site, and if there were any recommendations they could make to improve site organization and increase member usage. Recommendations were recorded by the interviewer. Finally, the Chief from each department was interviewed in the same manner. Results were then analyzed and recorded, to be used later in order to help develop further recommendations for CFA.

### **3.3 Analysis of CFA User Data and User Profiles**

In determining a solution to the project the use of CFA's preexisting data on users of *Brigades Online* was incorporated. CFA had a database of information on user profiles, complaints, and suggestions which had not yet been organized and interpreted. Emails from users to the online user support team were from September 1 through November 1, 2006, while calls to the 1-800 number were from January 3 through December 29, 2006. Suggestions and complaints about the site were gathered using both resources. CFA possessed limited information on statistics and use of the website, but using the user tracking software CFA web designers currently had in place, various login data were compiled including logins by brigade and region. CFA also has various data on their volunteers such as gender, age, and region which were used to create a demographic profile of the volunteers. Data that CFA did not have on their volunteers, but was needed for further analysis of the state of Victoria was acquired from the Australian Bureau of Statistics. These data include weekly income and population density. A map of Victoria was developed showing income and population to help understand various region volunteer demographics. By strictly adhering to the population characteristics of the

volunteer population, the sample size of the survey more accurately represented the entire population. Using the Australian Bureau of Statistics data, a demographic profile of the entire population of Victoria was completed. Maps were created with this data to visualize areas where usage may be low, such as rural farming areas where access to the Internet is limited. Maps of varying characteristics were superimposed to predict trends that may indicate low usage of *Brigades Online*. These maps can be found in Appendix B.

### **3.4 Demographic Construction of Sample Size**

It was impractical to interview the entire CFA membership. A sample size was targeted for interview. In order to make accurate conclusions about CFA, this sample size was structured to accurately represent the total population. A demographic study of the entire volunteer population was performed and proportionally reduced to a realistic sample size. For example, since about 18% of the total volunteer population is women, 18% of the sample size should also be women. The percentages of certain demographics for the entire population were taken and applied to a given sample size. The sample size accurately represented the total population. A sample size of 500 was chosen for time and cost reasons. Since CFA had limited data available in their volunteer databases, the population was broken into region, age, and gender. The population was split by gender, region, and by age group. The age groups used were less than 18, 19-25, 26-34, 35-44, 45-54, 55-64, and 65 and older. Any greater fragmentation of the population would have rendered numbers too small to analyze. In some cases rounding had become an issue, as for example some numbers were being rounded up more than they were being rounded down. Since most of the numbers in this category were rounded up, the demographic category was gaining numbers. This was remedied by a type of selective rounding,

where those numbers such as 1.52 which would be rounded up were instead rounded down since the difference between being rounded up or down in that case was only 0.03.

### **3.5 Surveys**

Two surveys were conducted. There was an online survey and a telephone survey. The telephone survey population was carefully controlled and was therefore the main survey instrument. The sample size was constructed to demographically represent the entire volunteer population. Therefore accurate conclusions about the entire population can be made through survey information gained through the sample size.

For the telephone survey, the population of volunteers was selected to demographically represent the total volunteer population. For example, when 30% of the total population is women then 30% of the survey population must also be women. Being done this way the telephone survey population was representative of the total population, which allowed for more accurate conclusions.

#### **3.5.1 Survey Composition and Questionnaire Construction**

To extract the information needed, a set of carefully constructed questions was prepared and administered to selected individuals. Consistency is imperative in applying a survey, so the questions were standardized and structured. The questions and offered responses were kept neutral to reduce bias. Specific wording of the questions was kept at a minimum and the meaning of words was clear to limit ambiguity. Much care was used to ensure that only one issue was addressed at a time per question. Also, the offered responses were designed so that the participant fit into a single category, as opposed to falling in between categories. An “Other\_\_\_\_\_” option was included in a question where an inconceivable category may exist

that wasn't previously considered when creating the survey. This allowed participants to express possible opinions that weren't previously addressed. Care was taken in the ordering of the questions, such that the questions flowed logically. Generally, the questions progress from general, factual questions to more specific, behavioral, attitudinal, and opinion questions. The questions were mostly close-ended multiple choice and dichotomous. Open-ended questions were included where it was necessary to gain the respondents' unrestricted opinion. These questions are important in formulating recommendations for improvements to the site. Contingency questions were also included directly following a few dichotomous questions where the previous response needed to be probed further.

The survey progressed through multiple drafts, vastly edited after pre-testing on volunteers. A copy of the final survey is in Appendix A – Survey. The final survey contains twenty three questions in total and can be completed with respect to three criteria. Dependent on the volunteer, the survey's questions can be answered regarding users, non-users, and both users and non-users of *Brigades Online*. The surveys' multiple routes can be viewed using the Flow Chart found in Appendix C – Survey Flow Chart.

The questions were divided into groups, which ultimately represented the goals of the survey. To create a logical flow, to aid in analysis, and to ease participants' anxiety, the questions were layered based upon their grouping. The first set of questions aimed to demographically categorize the participant based on gender, age, education, region, position in CFA, and frequency in responding to emergencies. The second set of questions established the participant's Internet usage/accessibility based on their access to both a computer and to the Internet, as well as where they have access. The participant's frequency for Internet and *Brigades*

*Online* usage was also established here. The third set of questions was aimed at recording the volunteer's opinion/recommendations of *Brigades Online*.

### **3.5.2 Survey Techniques**

Before compiling the surveys, research was completed in the areas of effective survey techniques. Many companies and independent the project group are able to use surveys as an effective means of gathering information about a specific group of their audience. The survey used for this project needed to be direct and concise due to time and accessibility limits. CFA's audience is very large and covers a vast amount of land. It was therefore deemed that the most effective technique to reach large numbers of volunteers would be by telephone interviews. Structured interviews and an online survey were also performed. In the structured interviews, the questions were asked and the data collected by the interviewer, rather than through the self-administered questionnaire, as was the case with the online survey. Careful considerations were taken to ensure that the survey was identical for each interview. Instructions on how to ask questions were provided to each interviewer on the survey from which they read. This standardization of the surveys reduced context effects. Although interviewed in different time periods and therefore under different contexts, effective standardization of the survey ensured that authentic results from the research could be warranted and used for comparison. The online survey was programmed into the *Brigades Online* homepage. Participants had the option of either sending the completed online survey back to CFA Headquarters by e-mail or through postage mail. Users were given the option of participating in the online survey with the incentive of a one hundred dollar certificate valid at CFA shop, which was randomly awarded to one of the participants



### 3.5.3 Survey Result Analysis

For both surveys, Microsoft Excel spreadsheets were formulated. The spreadsheets helped organize the data more efficiently. For each survey, data was placed into one extensive list. In order to breakdown the data, the project group used Excel's pivot table function to compare and contrast various questions. This function allowed the project group to identify specific volunteers by the answers that they provided. Groups of volunteers were also identified, and individual charts of volunteers by region, age, gender, position, Internet usage, etc. were created.

For the telephone survey, focus was placed on separating the 500 volunteers into sub-categories: users, non-users, and users and non-users of *Brigades Online*. Once the sub-categories were identified, the project group could then draw specific conclusions from the data. For example, the user sub-category could be broken down into males and females. Similarly, the non-users could be subdivided by region. The comparisons and contrasts were virtually unlimited as the project group could subdivide any sub-category by region, age, gender, position, Internet usage, and so on. It was important to note that introducing more parameters to the pivot table created smaller numbers to analyze. A similar approach was used for the online survey.

## 4 Results and Analysis

Analysis of survey results uncovered various repeating trends, and also uncovered some unique ideas for the improvement of *Brigades Online*. The majority of the volunteers interviewed did not identify these ideas; however, the project group deemed them important for consideration.

Section 4.5 discusses the limitations and errors of this study. However, it is necessary to address some of those limitations prior to presenting the results. It was found that the data was skewed towards volunteers who used *Brigades Online* because permission from each captain was required before contacting a brigade. Most captains giving permission were from brigades with high Brigades Online usage. Table 4-1 Example of Permission List for Brigades is a common example of brigades where permission was given and was not given.

Permission to call	Region	Brigade Name	w/ Logins	Total Members	Users
Yes	12	A1 Urban	8	31	26%
No	12	A2 Rural	3	65	5%

Table 4-1 Example of Permission List for Brigades

### 4.1 *Brigades Online Critique by The Project Group With Respect to Related Website Comparison*

Moderate use of *Brigades Online* by the project group uncovered additional findings. *Brigades Online* was launched in July 2000 and has not received a major redesigned since. It has been iteratively developed since that time with new content being added daily (Symons). Over the years some features have become either outdated or unpopular. The project group believe that the website needs a major renovation in a timely fashion. One important change would be a new homepage to greet users after login. The current webpage doesn't make immediately clear what's available to users. Title sections on that page do not contain drop down menus of their

features. Adding drop down menus, such as on the National Fire Protection Agency's homepage ([www.nfpa.org](http://www.nfpa.org)), would help users to see what's available. In addition, the layout of the front page could use more pictures to increase visual stimulation. Updates and news should be present on the homepage and not under a link as it currently is. Immediately upon logging onto the site, users should be able to see news and updates; the USDA Forest Services ([www.fs.fed.us](http://www.fs.fed.us)) is an excellent example of a good homepage.

Other recommendations are:

- When browsing *Brigades Online* it is often confusing to users as where they have been or what they've already seen. A history bar to track users' navigation would help reduce confusion when browsing.
- Volunteer contact information is greatly inaccurate and needs a major update.
- When accessing Brigade listings, users should be able to view all contact information, on the same page as the listings of their individual brigades.

## **4.2 Phone Survey Result Trends**

Survey results were compiled enabling the analysis of common themes throughout the data. Recognizing these common themes is crucial in understanding the underlying motivations and deterrents of site usage. By looking at demographic trends the project group can recognize both problematic and advantageous behavior alike amongst volunteers. Analysis of such behavior helps the project group discern probable causes of overall low site usage and inversely facilitates the exposure of popular utilities in *Brigades Online*.

A vast and varying amount of information was collected. Some of the basic data follows. These data gives a further perspective on the sample size and suggests something about the total volunteer population of Victoria.

From the fixed sample size, approximately 6% (28) of persons interviewed were Captains, 12% (60) Lieutenants, 4% (19) Secretaries, 56% (280) Operational Members (firefighters), and 23% (113) were Members (Table 4-2 Overall Position and Gender).

Position	Gender		Grand Total	Position Percentage
	Female	Male		
Captain		28	28	6
Lieutenant	4	56	60	12
Member	41	72	113	23
Operational Member (Firefighter)	37	243	280	56
Secretary	8	11	19	4
Grand Total	90	410	500	
<b>Gender Percentage</b>	18	82		

**Table 4-2 Overall Position and Gender**

Data of highest educational level reached was as follows: High School 62%, Technical and Further Education 21%, University 11%, Post-Grad 4%, and none of the above was 2% (Table 4-3 Overall Education). It was found that 10% of the sample size responds to emergencies daily, 35% respond weekly, 21% respond monthly, 13% respond fewer than that, and 21% never respond.

Highest level of education reached	Total	Percentage
High School	309	62
TAFE	104	21
University	57	11
Post-grad	19	4
None of the above	11	2
Grand Total	500	

**Table 4-3 Overall Education**

When computer access amongst volunteers was analyzed (Table 4-4 Overall Computer and Internet Access), results showed 8% (41 volunteers) did not have access to a computer while 92% did. Out of the 92% that have access to a computer, 95% (436 volunteers) have access to the Internet; meaning 87% of the total volunteer population has Internet access. Although, having access to the Internet does not necessarily mean it is used. Of the 459 volunteers with computer access, 41 choose not to use it, 33 of which have Internet access.

Regular access to a computer? (at least once weekly)	Does the participant use their computer?	Internet Access?		Grand Total
		No	Yes	
No	No	41		41
No Total		41		41
Yes	No	8	31	39
	Other		2	2
	Yes	15	403	418
Yes Total		23	436	459
Grand Total		64	436	500

**Table 4-4 Overall Computer and Internet Access**

Further analysis of Internet use can provide a more in-depth view of volunteers. Out of the 436 volunteers that have Internet access, 30% use dial-up and 70% use DSL/broadband/cable. A faster connection speed seemed to have an affect on rate of Internet use. For those with a quick connection speed, 69% contend to always use the Internet while only 29% of those with a slow connection speed always use the website (Table 4-5 Connection Speed and Internet Use).

Connection Speed	Rate of Internet Use				Grand Total
	Always	At least once a week	At least once a month	Never	
Dial-up	38	60	14	20	132
DSL / Broadband / Cable	209	65	17	13	304
Grand Total	247	125	31	33	436

**Table 4-5 Connection Speed and Internet Use**

Those who use the Internet most frequently are not necessarily more likely to be *Brigades Online* users (Table 4-6 Rate of Internet Use and Brigades Online). Also, connection speed does not play a part in the decision to use *Brigades Online* (Table 4-7 Connection Speed and Brigades Online). In both cases, the difference between *Brigades Online* users and non-users who always use the Internet or have a faster connection speed is not significant and solid conclusions cannot be made. While a faster connection speed inspires volunteers to use the Internet more, it does not encourage them to become *Brigades Online* users.

Rate of Internet use	<i>BOL</i> User?		Grand Total
	No	Yes	
I am always using the Internet	104	143	247
I use the Internet at least once a week	77	48	125
I use the Internet at least once a month	22	9	31
I never use the Internet	33		33
Grand Total	236	200	436

**Table 4-6 Rate of Internet Use and Brigades Online**

Connection Speed	<i>BOL</i> User?		Grand Total
	No	Yes	
Dial-up	86	46	132
DSL / Broadband / Cable	150	154	304
Grand Total	236	200	436

**Table 4-7 Connection Speed and Brigades Online**

Ultimately the most important difference amongst volunteers is whether or not they are *Brigades Online* users. It was found that 40% of volunteers use *Brigades Online* while 60% do not (Table 4-8 Brigades Online Usage).

<i>BOL</i> User?	Total	Percentage
No	300	60
Yes	200	40
Grand Total	500	

**Table 4-8 Brigades Online Usage**

Data in the remainder of this section will analyzed by *Brigade Online* users and non-users. Analysis of that 40% which reported *Brigades Online* use may yield trends that stimulate use of the site. The finding that 40% of the sample population reported use of the site is surprising. *Brigades Online* login records show that only 18% of its volunteer population has activated accounts (ONLINE Services). Since the sample size is representative of the total population, it is startling that the results of the phone survey disagree with actual records. There are several possibilities for this disagreement. Participants may have given misleading answers about their use of the site to appear in a favorable light to CFA. The disagreement may have arisen by pure

chance, as it was not a controlled factor. Alternatively, the data CFA has may be incorrect.

Finally, CFA’s Participants may also be using each other’s account. The question asked in the survey was “Are you a *Brigades Online* user?” Participants were not asked if they used their own accounts.

A regional usage breakdown of *Brigades Online* is shown in Table 4-9 Usage by Region. This table is important, as regions receiving low usage are made apparent. Reasons for low usage may be varied but with this data those regions, which are not using Brigades Online, can be targeted by CFA. Regions 18, 17, 20, and 4 are shown to use the site the least while regions 2, 8, 13, and 7 use the site the most.

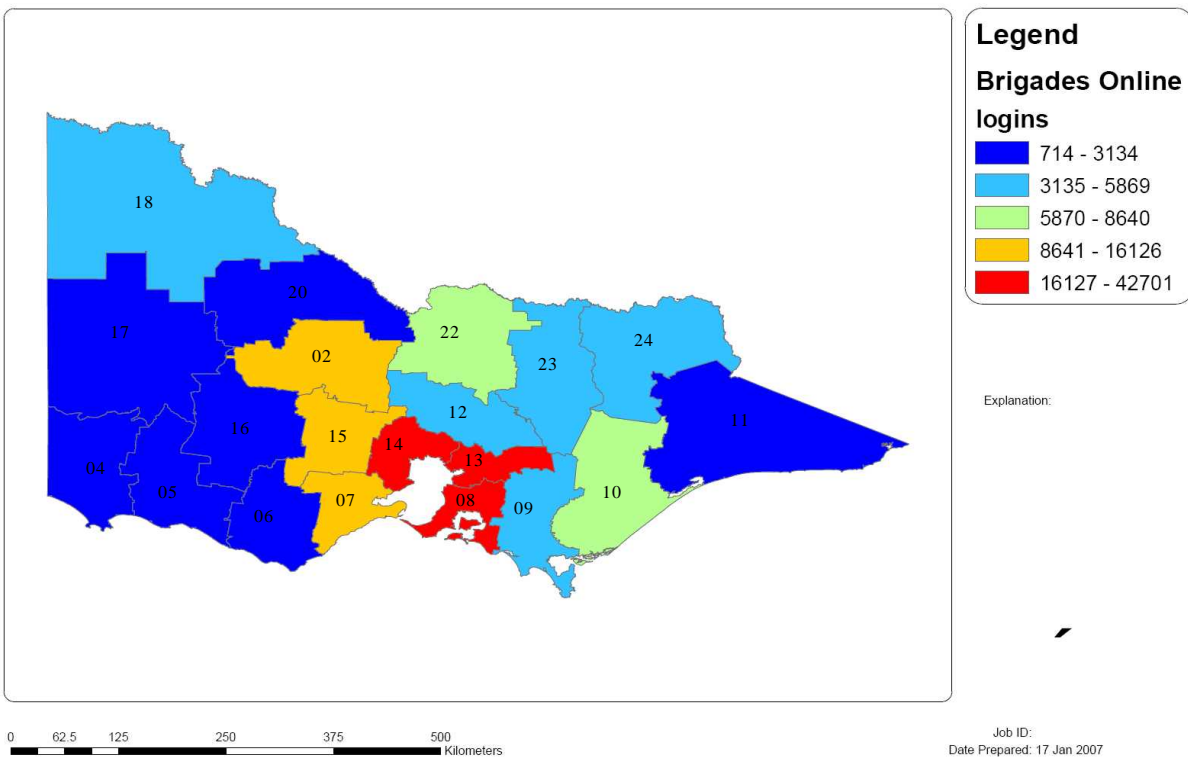
Region	BOL User?		Total Interviewed in Region	Percentage of Users by Region
	No	Yes		
2	13	22	35	63
4	18	4	22	18
5	15	20	35	57
6	13	5	18	28
7	7	11	18	61
8	9	15	24	63
9	7	8	15	53
10	18	6	24	25
11	7	5	12	42
12	13	9	22	41
13	8	13	21	62
14	10	13	23	57
15	15	16	31	52
16	20	8	28	29
17	33	4	37	11
18	17	2	19	11
20	15	3	18	17
22	18	13	31	42
23	19	13	32	41
24	25	10	35	29
Grand Total	300	200	500	40

**Table 4-9 Usage by Region**

Prior to commencing the phone surveys, a map was created from the amount of logins per region in 2006 shown in Figure 4-1 Map of Usage by Region. Although this map actually shows the amount of logins and not the amount of users per region, a speculative conclusion may be

made regarding the accuracy of the data gathered. Generally, regions with the highest percentage of users according to the survey also experience the most logins. Since the amount of logins per region will correlate with the amount of users per region, the data gathered is accurate since Table 4-9 Usage by Region and Figure 4-1 Map of Usage by Region agree. This tentative conclusion reduces the likelihood of two reasons for the discrepancy. Further research was performed into the possibility that some participants were Brigades Online users yet were using other's accounts.

Brigades Online - Number of Logins per CFA Region



**Figure 4-1 Map of Usage by Region**

The agreement between login rate by region according to CFA data and phone survey data was not verifiable for two reasons. First, those regions which were determined by the survey to have the lowest percentage of users, the least amount of Brigades Online users were interviewed.



For example, in region 18 only 2 *Brigades Online* users were interviewed. Because of this, it is impossible to make any significant claims concerning login rate by region. Secondly, the data from which the map was constructed does not match the question in the survey. The map was made from the amount of logins by region, while the data indicates the amount of logins made by individual users. The map is not totally reliable in that if a region has only one user who logs in 100 times a day, that region will appear to have the most users.

Question 17 of the survey was asked to all *Brigade Online* users and was concerned with the rate which members sign onto the site. When asked, participants were given the options of daily, weekly, monthly, and yearly as offered responses. As show in Table 4-10 Frequency of Brigades Online Usage, most of the participants who were users logged onto *Brigades Online* on a weekly or monthly basis, 39% and 37.5% respectively.

<b><i>BOL</i> sign-in rate</b>	<b>Total</b>	<b>Percentage of Users (200)</b>
Daily	16	8
Weekly	78	39
Monthly	75	38
Yearly	31	16
Never (non-users)	300	
Grand Total	500	

**Table 4-10 Frequency of Brigades Online Usage**

Table 4-10 Frequency of Brigades Online Usage provokes further questions concerning possible trends within the frequency of use categories. For analytical purposes, daily and weekly were grouped and considered highly frequent. When cross-referenced with position data in Table 4-11 Brigades Online Users - Positions and Relative Percentages, it was shown that the most frequent users of *Brigades Online* relative to their positions were Captains and Secretaries. Of the 28 Captains and 19 Secretaries interviewed, 18 Captains and 13 Secretaries were *Brigades Online* users (Table 4-11 Brigades Online Users - Positions and Relative Percentages). Of these users 67% of Captains and 62% of Secretaries were highly frequent users. These data become

significant when compared to that of the 60 Lieutenants, 280 Firefighters, and 113 Members interviewed (Table 4-11 Brigades Online Users - Positions and Relative Percentages). Of those interviewed 28 Lieutenants, 120 Firefighters, and 21 Members were *Brigades Online* users (Table 4-11 Brigades Online Users - Positions and Relative Percentages).

Position	Total Users	Percentage Relative to BOL users	Percentage Relative to Total Sample Size
Captain	18	4	64
Lieutenant	28	6	47
Member	21	4	19
Operational Member (Firefighter)	120	24	43
Secretary	13	3	68
Grand Total	200	40	

**Table 4-11 Brigades Online Users - Positions and Relative Percentages**

43% of Lieutenants, 45% of Firefighters, and 38% of Members were highly frequent *Brigades Online* users (Table 4-12 Highly Frequent Users by Position). This difference in frequency of use between Captain and Secretary and Lieutenant, Firefighter, and Member positions suggests that position has a strong influence on frequency of use.

Position	Total Highly Frequent Users	Percentage of Users Relative to Position	Percentage Relative to 94 (Total for highly frequent users)
Captain	12	67	13
Lieutenant	12	43	13
Member	8	38	9
Operational Member (Firefighter)	54	45	57
Secretary	8	62	9
Grand Total	94		100

**Table 4-12 Highly Frequent Users by Position**

There is a direct correlation between emergency response rate and *Brigades Online* use. Volunteers, who respond to emergencies frequently, daily or weekly, are most likely to be *Brigades Online* users. Of the 200 *Brigades Online* users interviewed, 35 responded daily and 112 responded to emergencies weekly, while 27 responded monthly, 11 responded less than monthly, and 15 never responded. On average, volunteers who do not use *Brigades Online* respond less to emergencies: 79 respond monthly, 53 respond fewer than monthly, and 88 never

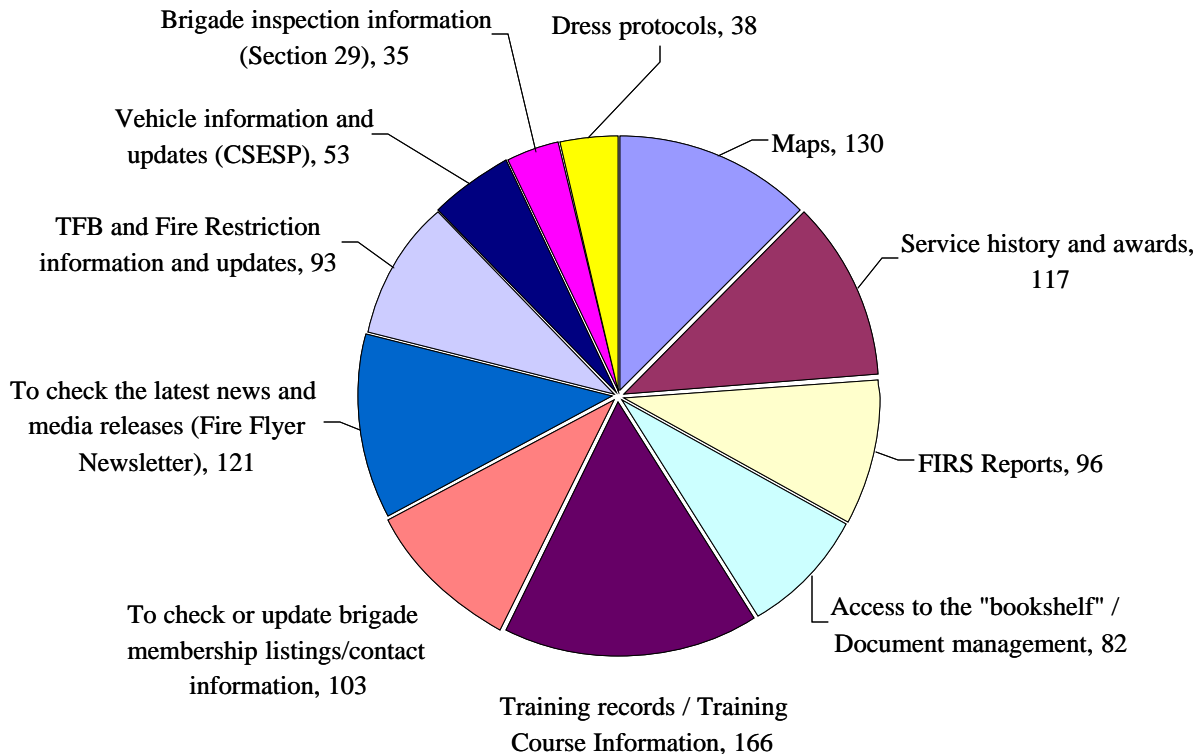
respond (Table 4-13 Overall Emergency Response Rate and Brigades Online Use). From these data, it is reasonable to conclude that use of the site is driven by rate of emergency response. It appears that as those volunteers who respond to emergencies most often are more involved in CFA affairs, they are more likely to use the site.

Interestingly, there was no connection between rate of emergency response and amount of *Brigades Online* use. Volunteers who respond to emergencies most often do not necessarily sign onto *Brigades Online* most often. So while volunteers are influenced to become *Brigades Online* users by the frequency with which they responds to emergencies, they are not influenced to use *Brigades Online* more frequently by the rate they respond to emergencies. Table 4-13 Overall Emergency Response Rate and Brigades Online Use illustrates the previously stated points regarding site login rate and emergency response rate correlations.

<i>BOL</i> user?	Rate of Emergency Response	Rate of <i>BOL</i> use					Grand Total
		Daily	Weekly	Monthly	Yearly	Never	
No	Daily or multiple times a day					16	16
	Weekly or multiple times a week					64	64
	Monthly or multiple times a month					79	79
	Fewer than the above					53	53
	Never					88	88
No Total						300	300
Yes	Daily or multiple times a day	4	19	11	1		35
	Weekly or multiple times a week	8	45	42	17		112
	Monthly or multiple times a month	4	5	14	4		27
	Fewer than the above		4	4	3		11
	Never		5	4	6		15
Yes Total		16	78	75	31		200
Grand Total		16	78	75	31	300	500

**Table 4-13 Overall Emergency Response Rate and Brigades Online Use**

Question 18 of the survey addressed the parts of the site used by volunteers. It is important for CFA web designers to know which aspects of the site are being used most and least. A pie chart, found in Figure 4-2 Site Usage was made to demonstrate the relative use of varying parts of the site.



**Figure 4-2 Site Usage**

Figure 4-2 shows the use of each aspect of the site relative to other aspects, illustrated by the portion of the pie each slice received, as well as the amount each aspect is used, shown by the number next to each slice label. This number is the amount of volunteers who used *Brigades Online* (200) who reported to have used that aspect of the site. *Brigades Online* is used most for training purposes as 166 members, or 83%, log on to the site and check training information. Brigade inspection information is the least checked part of the site, receiving only 35, or 18% of

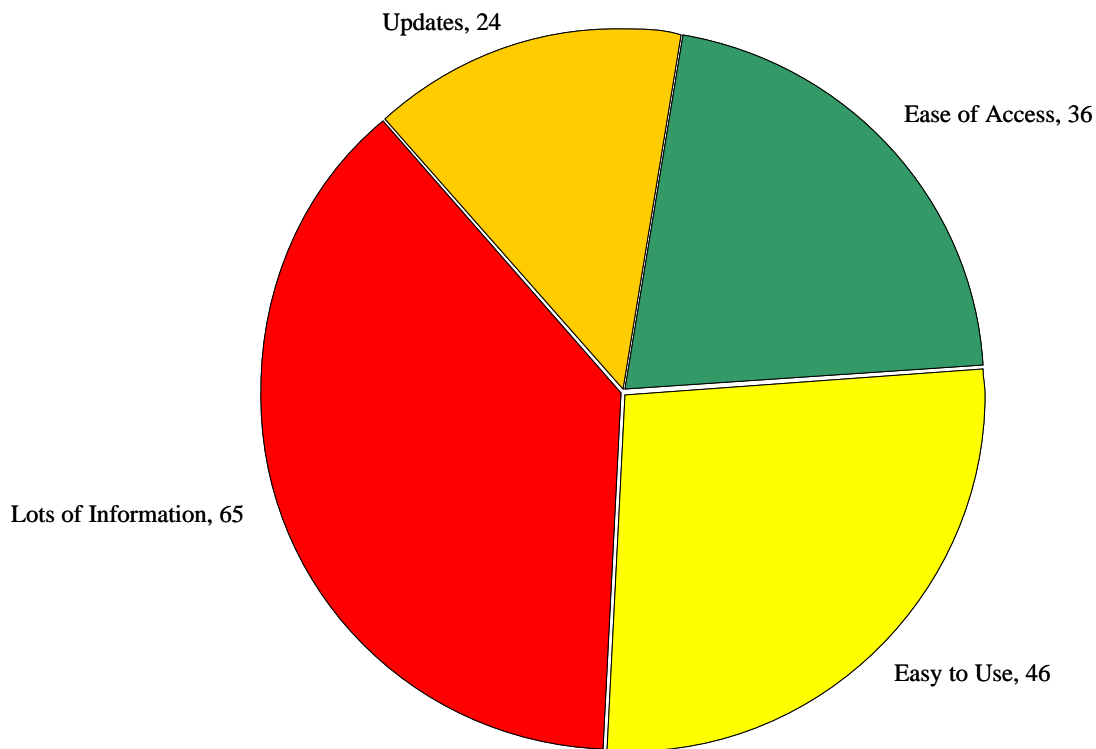
the total users. However, brigade inspections only occur once a year which may be the cause for the low usage.

Site usage can be further broken up and analyzed by looking at which aspects of the site different positions use most and least. For each position, a pie graph similar to Figure 4-2 Site Usage was prepared to show the site usage breakdown for each position. These pie charts can be found in Appendix B – Site Usage by Position Pie Charts. With the exception of brigade inspection information; each position had a proportionate breakdown of site usage compared to the cumulative site usage pie chart. The charts for Captains and Secretaries showed a much larger slice, and therefore more use, for brigade inspection information. Of the 18 Captains who were users, 12 used brigade inspection information. Secretaries were the second most avid users of brigade inspection information, with 6 of the 13 BOL users reporting use of this part of the site. Proportionally, firefighters use this part of the site the least, as 9 of 120 users reported use (Appendix B – Site Usage by Position Pie Charts).

Questions 19-23 of the survey offered participants the opportunity to give open responses. Because of this, it was assumed that these responses would not be empirically analyzed. As it turned out, certain trends of answers became apparent through the course of interviews in questions 19, 20, and 22. After the surveys were completed, common answers to these questions were standardized. Through this standardization, the responses were empirically analyzed.

Question 19 of the survey was “What do you like most about the site?” Answers to this question were standardized to “Ease of Access, Easy to Use, Lots of Information, and Updates.” “Ease of Access” means participants enjoyed the ability to access the information on *Brigades Online* from work or home at their leisure. In the past, items on *Brigades Online* could only be

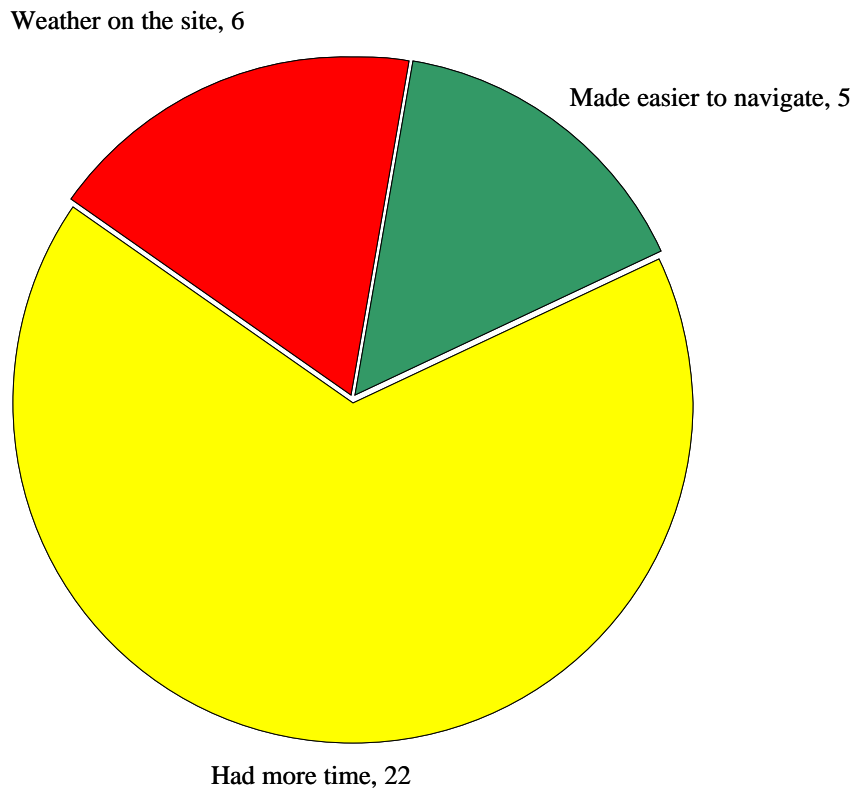
found at the station or had to be requested. The other standardization is self-explanatory. Of the 200 *Brigades Online* users, 149 responded with answers, which could be standardized. Since users sometimes gave responses that were standardized into two different categories, a total of 171 total standardized responses were analyzed. As Figure 4-3 Question 19 (“What do you like most about the site?”) Response Standardization indicates, participant liked most the amount of information available on the site. Updates was the least given response.



**Figure 4-3 Question 19 (“What do you like most about the site?”) Response Standardization**

Question 20 of the survey was “What would motivate you to use the site more?” Answers to this question were standardized to “Weather on the site, Made easier to navigate, and had more time.” Only 33 participants gave responses to this question that could be standardized. Of these, by far the most common response was they would use the site more if they had more time. This is uncontrollable by CFA. The other responses did not receive enough participants to be

statistically significant (Figure 4-4 Question 20 (“What would motivate you to use the site more?”) Response Standardization).



**Figure 4-4 Question 20 (“What would motivate you to use the site more?”) Response Standardization**

Question 22 of the survey was “What websites do you visit that interest you and why, specifically, the URLs or web addresses?” Answers to this question were standardized to “BOM, DSE, CFA public site, Google, and CFA Stream.” The results are shown in Figure 4-5 Question 22 (“What websites do you visit that interest you and why, specifically, the URLs or web addresses?”) Response Standardization. CFA Stream, the Bureau of Meteorology site, and the Department of Sustainability of Environment site are discussed further in the Unique Opinions section. Of the 200 Brigades Online users interviewed, 79 gave responses, which could be standardized into the basic categories. Since some participants gave multiple websites, the total amount of responses standardized was 178. The BOM site is the most used, receiving 60 of 178

total responses. Since volunteers use the BOM site to check weather, this statistic is unchangeable unless CFA plans on adding weather to their website. The second most used website was DSE receiving 50 standardized responses. Volunteers use the DSE site mainly to check current fires on an interactive map on the site. CFA may be able to deter this group by including a map similar to DSE's on *Brigades Online*. Although the least given response, it is important to recognize the 17 responses given for CFA Stream. CFA Stream has a small number of registered members and may not be as well known as other sites. Volunteers use CFA Stream mainly for a discussion forum. CFA could discourage CFA Stream users by including a discussion forum on *Brigades Online*.

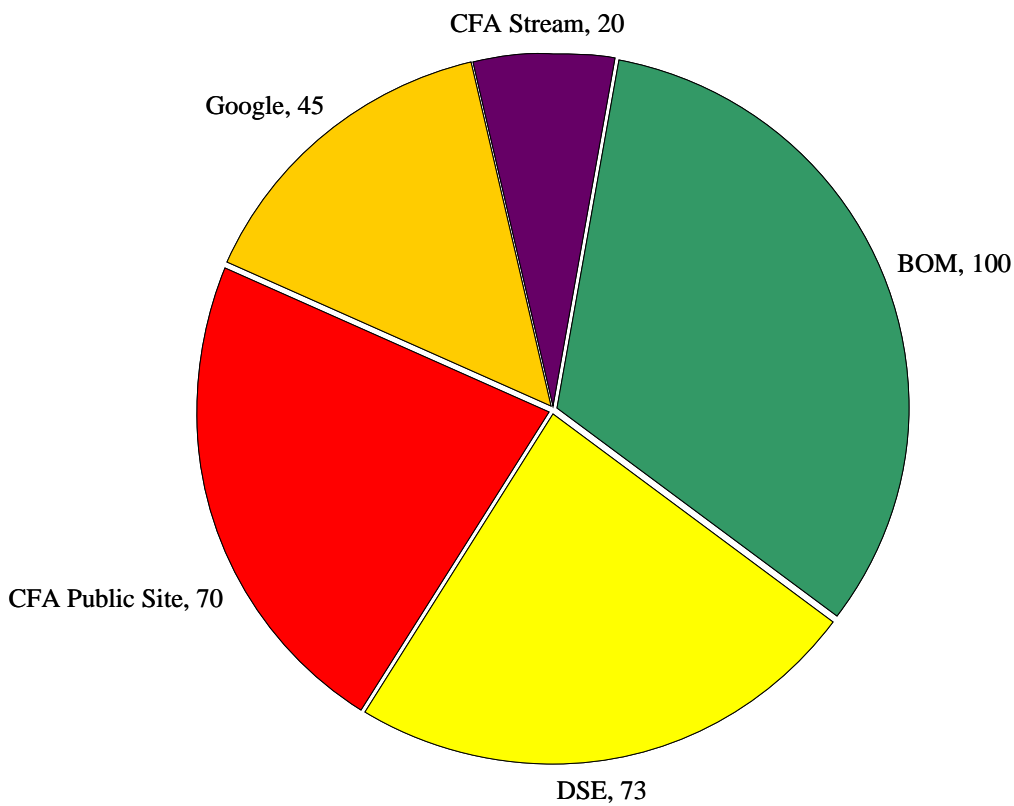
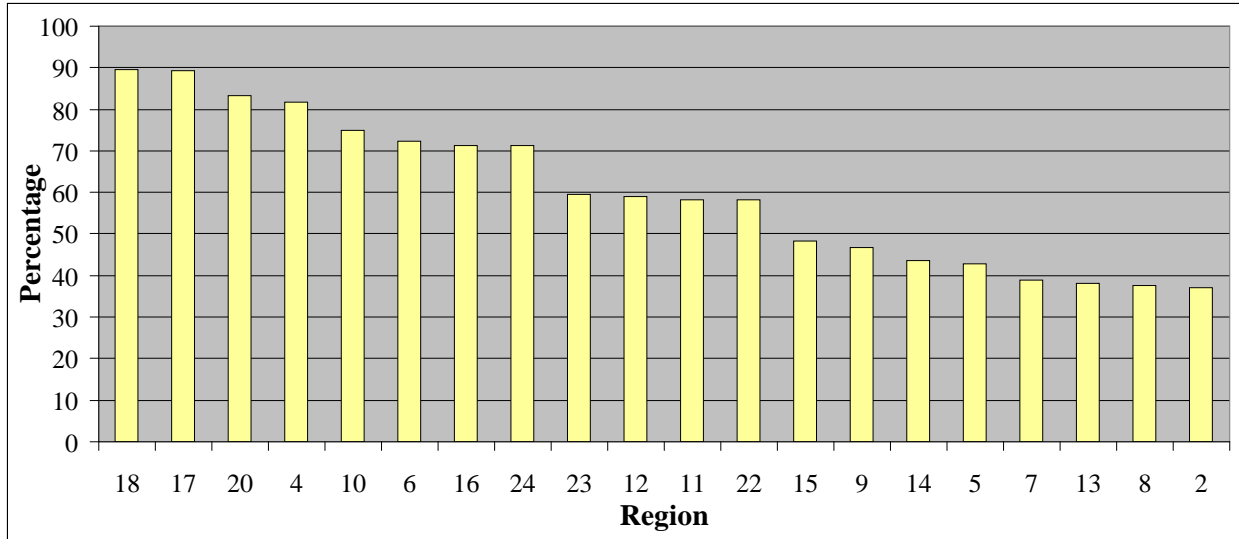


Figure 4-5 Question 22 (“What websites do you visit that interest you and why, specifically, the URLs or web addresses?”) Response Standardization



Of the 60% that do not use the site, it was important to analyze data to gain knowledge about which volunteers and what regions are not using the website. Areas that were looked at were their volunteers' region, gender, and position. When analyzing to see how gender affects the non-user rate of *Brigades Online*, it was found that 59 of the 90 total females (66%) that were surveyed did not use *Brigades Online*. As for males it was found that 241 out of 410 that were surveyed (59%) said that they did not use *Brigades Online*. These findings showed that both genders are not equally using the site.

When data of non-users of *Brigades Online* was examined by regions, it was found that a number of regions had a vast majority of volunteers not using the site. (Figure 4-6 Percentage non-users by region). Regions 18, 17, 20, and 4 all had over 80% of volunteers not using the website, where regions 18 and 17 represented the regions with the highest percent of non-users at around 89%. There were also 4 regions (10, 6, 24, 16) that had over 70% of the volunteers not using the website, and 4 regions that had over 58% of volunteers that did not use the website (23, 12, 22, 11). The remainder of the regions had fewer than 50% of the volunteers that were non-users. This type of analysis is helpful in spotting regions that are problem areas for *Brigades Online* Management.



**Figure 4-6 Percentage non-users by region**

From the outset, the project group knew that there was a high amount of non-users (BRIGADES ONLINE INTRODUCTION). As a result it became important to discover which sites were being used instead of *Brigades Online*. Upon analysis of the surveys, it was noted that five websites were being used more often than others. These websites include: CFA public site, CFA stream, Bureau of Metrology (BOM), Department of Sustainability and Environment (DSE), and Google. There were also various other informative websites that were mentioned, but did not have a significant impact on the total data. It is also important to note that the volunteers themselves gave all this information. The total instances where each website was mentioned were then tabulated. This information was then compared with respect to whether or not they used *Brigades Online*.

For Question 22, volunteers were asked which other websites that they visit. This open-ended question led to a total of 146 responses with a wide variety of websites mentioned. When the responses were grouped into the five previously mentioned sites, none of the responses totaled more than fifty. The website that was mentioned the most was the BOM site. Of the 300 total non-users of *Brigades Online*, BOM was mentioned in 40 surveys (13%). CFA's main

website was listed in 38 surveys (13%). Google and DSE were cited to some degree of significance at 26 and 22 times, 9% and 8% respectively. This data shows that a number of volunteers are using other websites instead of *Brigades Online*.

*Brigades Online* non-users were viewed more closely to help determine why volunteers are not using the website. Out of the 300 volunteers that do not use *Brigades Online*, it was found that 122 volunteers have heard, or at one time used *Brigades Online*. This number equals 41% of all non-users and 22% of the sample size.

Using gender, a comparison was made between males and females who have heard about the site but do not use it. A total of 19 Females (21%) and 103 Males (26%) knew about the site but did not use it. This similarity in the percentages of males and females who know about the site but do not use it suggests that gender has little effect on volunteers using *Brigades Online* (Table 4-14 Non-users by gender).

Gender	Total	Grand Total	Percentage do not know about <i>BOL</i>
Female	19	90	90
Male	103	410	410
Grand Total	122	500	500

**Table 4-14 Non-users by gender**

With the volunteers who knew about the site but did not use it, there was little difference between genders, but there was between regions. It was found that in multiple regions, 30% of the non-users at one point had heard of *Brigades Online*. These instances happened most often in regions 9 and 10, 40% and 50% respectively. Other regions of note were region 4 (36%), region 6 (33%), region 14 (30%), region 18 (32%), and region 23 (34%). This data becomes significant when compared to that of regions 11, 13, 17, and 20. In region 17, only 3 volunteers stated that they knew about the site but did not use it. This low percentage of 8% is similar to those of region 11 (17%), region 13 (14%) and region 20 (17%). This difference in percentages between the two sets of regions shows that region has a major influence on whether or not

volunteers will use the site. However, upon further analysis within each region, it was found that no connection existed between non-users and users who knew about the site but did not use it.

In order to discover probable reasons for volunteers who knew about the site but did not use it, the project group examined their responses to Question 16 of the survey. This open-ended question was sorted into 4 specific categories: No Access (volunteers had no access to a computer or the Internet), No Login (volunteers had no *Brigades Online* username or password), No Need (volunteers did not feel that *Brigades Online* was necessary), and Has not used but intends to (volunteers were planning on applying for a username and password in the near future). By categorizing the responses, the project group was able to classify 87% of the total responses. Of these responses, it was reported that 24% said that they had no access to *Brigades Online*, while 19% said that they do not have login information. These percentages are very important because when combined, they show that 43% of the sample size is not using *Brigades Online* due to a lack of information or technology. Another important outcome from this analysis was that 36% said that they felt no need to use the website. This type of information is important because it illustrates that about one-third of the non-users who know about *Brigades Online* felt that the website was not useful (Table 4-15 Question 16 - “Why are you not using *BOL?*”).

	Reason for not using				
Q- Do you know what Brigades Online is?	Has not used but intends to	No Access	No Login	No Need	Grand Total
No					178
Yes	11	29	23	44	122
Grand Total	11	29	23	44	300

**Table 4-15 Question 16 - “Why are you not using *BOL?*”**

While there are some volunteers who have heard about *Brigades Online*, there are many who have not. Out of the 300 volunteers that do not use *Brigades Online*, there are 178, or 59%,

of volunteers who have never even heard of the site. Out of the entire sample size, 16% of volunteers have never heard of *Brigades Online*. Although these volunteers have never used the site, they are not necessarily at fault because most do not know *Brigades Online* exists.

In the initial analysis of volunteers that do not know about *Brigades Online*, questions using general demographics were considered to see if there were any trends. In regards to gender, it was observed that a greater percentage of females have never heard of *Brigades Online*. From the fixed sample size of people interviewed, 40 (44%) females and 138 (34%) males have never heard of *Brigades Online* (Table 4-16 Knowledge of the site by gender).

Do not know about <i>BOL</i>		Total Volunteers		Percentage do not know about <i>BOL</i>
Gender	Total	Gender	Total	
Female	40	Female	90	44
Male	138	Male	410	33
Grand Total	178	Grand Total	500	

**Table 4-16 Knowledge of the site by gender**

As with previous analysis of non-users who knew about the site but did not use it, the project group decided to examine whether or not region had any impact on usage of *Brigades Online*. It was determined that region may or may not be a determinant of *Brigades Online* usage; however, there are a few regions where over 50% of the population does not know about *Brigades Online*. Region 17 contains by far more volunteers that have never heard of the site than any other region. Out of the 37 total volunteers, 30 people have never heard of *Brigades Online*, or 81%. Regions 20, 18, 16, also had over 50% of the region where volunteers had never heard of *Brigades Online*. This finding is important because these regions have some of the lowest numbers of emergencies in all of Victoria (Table 4-17 Knowledge of site by region).

Do not know about <i>BOL</i>		Total Volunteers		Percentage do not know about <i>BOL</i>
Region	Total	Region	Total	
2	7	2	35	20
4	10	4	22	46
5	8	5	35	23
6	7	6	18	39
7	3	7	18	17
8	4	8	24	17
9	1	9	15	7
10	6	10	24	25
11	5	11	12	42
12	8	12	22	36
13	5	13	21	24
14	3	14	23	13
15	9	15	31	29
16	14	16	28	50
17	30	17	37	81
18	11	18	19	58
20	12	20	18	67
22	12	22	31	39
23	8	23	32	25
24	15	24	35	43
Grand Total	178	Grand Total	500	36

**Table 4-17 Knowledge of site by region**

When data concerning age was studied, no observable trend developed. In most age groups, it was determined that about 30% of the demographic had heard of *Brigades Online*. The only age group with a majority who never heard of *Brigades Online*, was “Less than 18”. Also, the 65 and older age group had similar results with 29 out of 62 (47%) volunteers who never heard of *Brigades Online*. These results showed that age had little effect on how often *Brigades Online* was known, but there were a significant number of volunteers that did not know about *Brigades Online* in the youngest and oldest age groups (Table 4-18 Knowledge of site by age).

Do not know about <i>BOL</i>		Total Volunteers		Percentage do not know about <i>BOL</i>
Age	Total	Age	Total	
18-25	14	18-25	46	30
26-34	15	26-34	63	24
35-44	26	35-44	95	27
45-54	38	45-54	110	35
55-64	38	55-64	90	42
65 and older	29	65 and older	62	47
Less than 18	18	Less than 18	34	53
Grand Total	178	Grand Total	500	

**Table 4-18 Knowledge of site by age**

As previously stated, region has an effect on how often volunteers respond to emergencies. When the frequency of volunteers' emergency rate was analyzed in conjunction with non-users who do not know about *Brigades Online*, a trend was found. Volunteers who respond to emergencies frequently, meaning daily or weekly, are more likely to know about *Brigades Online*. Of the 178 volunteers who have never heard of *Brigades Online*, only 5 respond to emergencies daily and 21 respond weekly, as compared to the 47 who respond monthly, 42 who respond fewer than monthly, and 63 who never respond to emergencies. From this data, the project group concluded that the rate at which volunteers respond to emergencies has a direct effect on whether or not they have heard of *Brigades Online* (Table 4-19 Knowledge of site by emergency response rate).

<b>Do not know about BOL</b>		<b>Total Volunteers</b>		<b>Percentage do not know about BOL</b>
<b>Emergency response rate</b>	Total	<b>Emergency response rate</b>	Total	
Daily or multiple times a day	5	Daily or multiple times a day	51	10
Weekly or multiple times a week	21	Weekly or multiple times a week	176	12
Monthly or multiple times a month	47	Monthly or multiple times a month	106	44
Fewer than the above	42	Fewer than the above	64	66
Never	63	Never	103	61
Grand Total	178	Grand Total	500	36

**Table 4-19 Knowledge of site by emergency response rate**

The project group also tried to determine whether or not Internet access had an effect on non-users who had never heard of *Brigades Online*. It was found that of the 64 volunteers who responded that they do not have access to *Brigades Online*, 46 (72%) of them had never heard of *Brigades Online*. Also, when looking at the volunteers who do have Internet, 30% have never heard of *Brigades Online*. These findings show that volunteers without Internet access are more likely to not know about *Brigades Online* (Table 4-20 Internet access and do not know about site).

<b>Do not know about BOL</b>		<b>Total Volunteers</b>		<b>Percentage</b>
<b>Internet access?</b>	Total	<b>Internet access?</b>	Total	
No	46	No	64	72
Yes	132	Yes	436	30
Grand Total	178	Grand Total	500	36

**Table 4-20 Internet access and do not know about site**

Further analysis of the group of volunteers who do not use *Brigades Online* and do not know about it was conducted using the gender and position of the volunteers. The project group used questions 1 and 5 from the survey. After viewing the results, it was found that 69% of the total females that were Members had never heard of *Brigades Online*. It was also found of the 72 males who were Members, 37 (51%) answered that they have never heard of *Brigades*



*Online*. In both cases, the high percentage indicates that there was a pattern to how gender and position affects knowledge of the site.

When looking at the data in further detail, it was discovered that some positions were unknowledgeable about *Brigades Online*. All of the female Lieutenants knew about the site, and a vast majority of the Captains and Secretaries had heard of *Brigades Online*. Only 1 out of 8 (13%) female Secretaries did not know about the site, and there were no female Captains. For the males, only 7% of Captains and 9 % Secretaries did not know about the site. This information is important because it illustrates that the brigade position dictates knowledge of the site.

The project group decided to combine previous analysis to create an in depth view of non-users who do not know about *Brigade Online*. Gender, position and frequency of emergency response were the demographic categories used to create this set of data.

The significant trends which depict problem areas, are highlighted in Table 4-21 Gender, Response to make reading easier. Female members were then most unknowledgeable of *Brigades Online*; out of the 41 interviewed, 66% have never heard of *Brigades Online*. Of this 66% all but one said that their response rate to emergencies was at best less than monthly. This shows a direct correlation between their response rate and their knowledge of *Brigades Online*.

Similar trends were also found for male members. There were a total of 53 male members who never respond to emergencies, 32 of which reported that they never have heard of *Brigades Online*, equaling 60%. Also, 36 of the 37 male members who never have heard of *Brigades Online* respond to emergencies less than monthly. This trend further proves that position and frequency of emergency responses have a direct influence on knowledge of *Brigades Online*. This trend also existed for the Male Operational Members. Of the 41

Operational Members who answered “fewer than above”, 29 had never heard of *Brigades Online* or 71%. Of the Male Operational Members who respond monthly, 49% have never heard of *Brigades Online*. From this data, it is reasonable to conclude that knowledge of the website is driven by the rate of volunteer emergency response rate (Table 4-21 Gender, Emergency Response Rate (Never heard of *BOL*)).

Gender	Position	Emergency Response Rate	Total – never heard of <i>BOL</i>	Percentage (never heard / total for that position and response rate)
Female	Member	Weekly or multiple times a week	1	100
		Fewer than the above	5	83
		Never	21	66
		Member Total	27	66
Male	Member	Monthly or multiple times a month	1	13
		Fewer than the above	4	67
		Never	32	60
		Member Total	37	51
	Operational Member	Daily or multiple times a day	4	13
		Weekly or multiple times a week	14	14
		Monthly or multiple times a month	32	49
		Fewer than the above	29	71
		Never	6	60
		Operational Member Total	85	35
Grand Total			178	

**Table 4-21 Gender, Emergency Response Rate (Never heard of *BOL*)**

### **4.3 Online Survey Result Trends**

The results from the online surveys were compiled and analyzed in a similar fashion to the phone survey results. Two important notes about the data are that 266 surveys were returned through e-mail, while only 1 survey was sent to CFA Headquarters by postage mail. With this fact in mind, the term “online surveys” will be taken to represent the 237 e-mail responses and the single postage mail response. Also of note, a total of 267 responses were received; however,

only 238 of those 267 were usable. This was because some e-mails did not contain the proper attachments, or the survey was not embedded in the e-mail correctly making it incomplete.

Before a comparison and contrast between the two sets of data was completed, an important difference was discovered. Namely, the phone surveys represented a demographic picture of volunteers in the entire state of Victoria in a small sample size, but the online surveys failed to accomplish this task. The online surveys could not be considered a representative sample of the volunteers in the state of Victoria because the region, age, and gender requirements outlined in section 3.4 were not met. Some regions were not represented at all, and the majority of volunteers resided in Regions 8 (20%), 14 (18%), and 13 (15%). Each age group was represented, but the total percentages of volunteers per age group were not accurate according to the calculated set of percentages. The Male to Female percentages (89% to 11%) were close to the projected values (82% to 18%), but without the combination of the three sets of parameters, the online surveys fail to provide an accurate sample of the volunteers in the state of Victoria. Therefore, the project group decided that the use of this data would be only in a supplementary, rather than a primary manner. No conclusions or theories were generated using the online surveys; however, a comparison and contrast of the two sets of data were employed, and recommendations were partially determined using the data gathered from the online surveys.

With this in mind, the data was still analyzed and then compared to the phone surveys. Basic statistics from the online surveys showed that of the 238 survey participants, 6% were Captains, 21% Lieutenants, 8% Secretaries, 61% Operational Members (firefighters), and 4% Members. This data was similar to that of the phone surveys. Information concerning the highest educational level reached was as follows: High School 38%, Technical and Further Education 31%, University 20%, Post-Grad 8%, and none of the above 3%. In contrast, the

phone surveys showed a much larger percentage of volunteers reached High School and then smaller percentages for Technical and Further Education, University, Post-Grad, and none of the above. For the response rate of volunteers, 20% of the participants respond to emergencies daily, 46% respond weekly, 26% respond monthly, 5% respond fewer than that, and 3% never respond. The major difference with this set of data was that in the phone surveys, a lower percentage of volunteers respond daily and a higher percentage never respond.

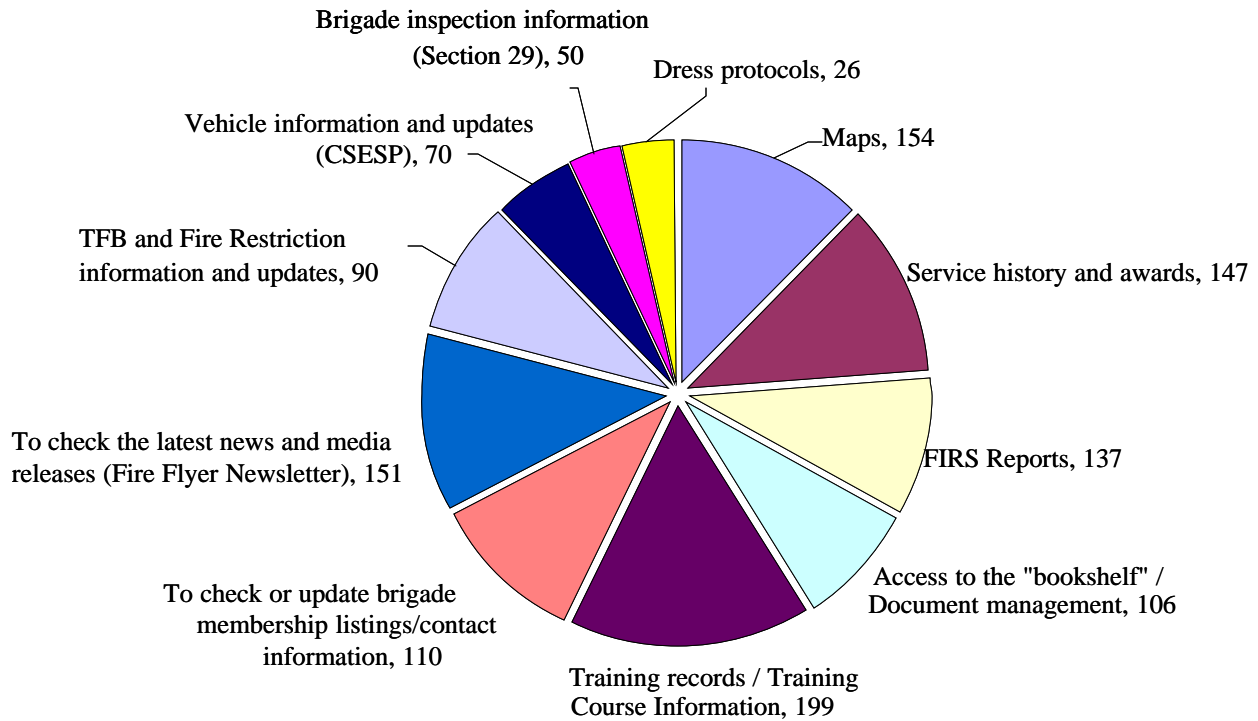
Perhaps the greatest difference in the two surveys was that 100% of the online participants have computer access, use their computer, and have Internet access. The phone survey results showed that only 87% of the total population had Internet access. There were also volunteers who chose not use the computer and/or the Internet.

As with the phone survey results, one goal of the online surveys was to determine which of the volunteers use *Brigades Online* and those who do not. For the phone surveys, 60% do not use the site and 40% do. From the online data, 1% do not use the site and 99% do. The stark contrast between the two sets of data was due to the fact that the link to the survey was placed on the home page of *Brigades Online*. Those who did not have access to a computer and the Internet were automatically eliminated from the possible pool of participants. The 1% who do not use the site consisted of three volunteers: two operational members and one lieutenant. From the 99% who use the site, it was found that 6% were Captains, 20% Lieutenants, 9% Secretaries, 61% Operational Members (firefighters), and 4% Members. In contrast, the phone surveys yielded a much higher percentage of Captains, Lieutenants, Secretaries, and Members and a lower percentage of Operational Members. Similar to the phone surveys, position and frequency of use were also compared using the daily and weekly log-in rates combined and considered as

high frequency of use. The results concurred with the phone surveys in that Captains had the highest frequency of use.

Another trend that was analyzed using the phone surveys was the correlation between emergency response rate and *Brigades Online* use. It was found that on average, non-users responded less frequently to emergencies than users. From the online surveys, the three volunteers who do not use *Brigades Online* respond to emergencies monthly and fewer than monthly. This similarity in the two sets of data is likely to be skewed by the minimal amount of non-user responses to the online survey; however, the comparison remains. Another similarity between the sets of data was the lack of a relationship between rate of emergency response and amount of *Brigades Online* use.

In regards to site usage, Figure 4-7 Online Survey Site Usage depicts the data as a pie chart with each aspect of the site represented by a different slice. The labels consist of the section name of the site, the number of volunteers who said they used that particular section, and the percentage that number represents.



**Figure 4-7 Online Survey Site Usage**

This chart shows that Training records and/or Training Course Information is used the most (16%), which compares to the results from the phone surveys. In contrast, Dress protocols (2%) are used the least for the online surveys, while Brigade inspection information is used the least in the phone surveys.

#### **4.4 Unique Opinions**

The final portion of the survey offered volunteers freedom in their answers because the questions asked were open-ended. Since the participants were not confined in their answers, some of the responses were unique and could not be analyzed through trends. Even though a response may have been received from only one participant, it does not necessarily mean that the response would not be supported by more of the sample population. Since the sample population was not asked their opinion on the complaint or suggestion received from other participants, the complaint or suggestion cannot be empirically analyzed. Because of this, phone survey

responses and online survey responses were combined in this section. Also, some volunteers contributed unrealistic complaints and suggestions, such as supplying all secretaries with a computer, printer, fax machine, and Internet access. In the interest of brevity, these complaints and suggestions were not included. For these reasons, this section is not as scientific as the former. Data cannot be cited to support the possible success of implementing a suggestion or predicting the outcome in addressing a complaint. These unique complaints and suggestions are important however, as they could lead to improvements in the site, which would possibly, increase or inspire usage. Many of the suggestions, although given separately, can be linked together to form more complex ideas. The suggestions, complaints, and comments that this section cites stem from responses to Questions 19-23 of the survey.

Multiple suggestions would possibly increase site usage, but were not changes to the site itself. For example, it was suggested that advertisements in newsletters about *Brigades Online* that detail how to get an account and outline the benefits of use of the site may help increase usage. These advertisements could specifically target regions with the least *Brigades Online* users. It was also suggested that CFA provide stations, particularly in rural areas, with computer and broadband Internet access. At the very least, group headquarters should be provided with computers and Internet access. Some stations have dial-up connections and outdated computers that do not comply well with the data, such as maps and larger documents on *Brigades Online*. Members of the brigade would all have Internet access if it was provided at the station. They could view maps, news, and training information on their own. The participant who gave this suggestion also noted that compact discs (CD) are sometimes sent to brigades with training information and other material. Since the computers at stations in rural areas are often outdated and lack CD players, these CDs containing important training information become useless.

With the continued advancement of computer technology, more and more people are beginning to use the Internet for their everyday needs. Individuals are using the Internet to get their daily news, to do their banking and shopping, and even to complete academic courses and training courses (Donthu). In particular, online banking has become popular because customers prefer the convenience of being able to check their balances, make payments, and withdrawal and deposit money whenever and wherever they want. Ultimately, the changeover from paperwork to computer files is an attractive option for any organization looking to streamline their business. A frequent complaint was that FIRS reports can be viewed online yet could not be submitted online. One participant remarked that all paperwork should ultimately be eliminated and converted to an electronic format. Secretaries would be able to print and distribute any necessary documents. This may force volunteers to use the site more frequently.

Another similar suggestion is that CFA should include some online training through *Brigades Online*. CFA already has downloadable training manuals available in PDF format but some participants requested more. Substantial complaints were received concerning inadequacy in the training section of the website. These complaints are important because the Training Records / Training Course Information section of the website was the most frequented (Figure 4-2 Site Usage). One participant suggested that regional and statewide training sessions be made available to all volunteers. If a volunteer is unable to attend a training session at his or her brigade, or if one is not offered, then they should have the opportunity to find other sessions at other brigades across Victoria. These additions would be enticing to those who already use the site and also to prospective members who may take advantage of these opportunities as well.

A common suggestion was the addition of an external links section to the site. There already is an external links section on *Brigades Online*, but it is very hard to find, and many



volunteers do not know it is there. From the question regarding which websites volunteers used, a list of links with a basic explanation of each was compiled:

- Department of Sustainability and Environment (DSE) Fires and Other Emergencies ([www.dse.vic.gov.au/fires/](http://www.dse.vic.gov.au/fires/)) - Many volunteers use this site to check incidents and current fires. They especially like the map on this site which provides live fire and emergency updates corresponding to their location in Victoria.
- Sentinel Hotspots (<http://sentinel2.ga.gov.au/acres/sentinel/index.shtml>)- Jointly developed by CSIRO Land and Water, Geosciences Australia, and the Defense Imagery and Geospatial Organization, this operates as a national bushfire monitoring system. Much like the DSE site, this site provides a mapping system which provides information about emergency hotspots.
- Web Fire Mapper: Australia ([http://maps.geog.umd.edu/activefire\\_html/checkboxes/aus\\_checkbox.htm](http://maps.geog.umd.edu/activefire_html/checkboxes/aus_checkbox.htm)) – This site is maintained by the University of Maryland’s Department of Geography. It gives users the opportunity to selectively map portions of Australia and view the active fire locations of that region.
- Bureau of Meteorology ([bom.vic.gov.au](http://bom.vic.gov.au))- by far the most popular weather site used by volunteers
- Elders Weather ([Eldersweather.com.au](http://Eldersweather.com.au))- weather site
- Weatherzone ([www.weatherzone.com.au](http://www.weatherzone.com.au)) –weather site
- CFA Stream (<http://www.cfastream.info>)- a popular website among volunteers. This site is used mainly by volunteers as a discussion forum. The site currently has 1,231 members (as of 23 February 2007).
- CFA Shop ([www.cfashop.com.au/](http://www.cfashop.com.au/))- A site which offers CFA gear such as clothing, books, badges, stickers, etc.
- CFA Pix (<http://cfapix.lookat.me.com.au/>)- Described as “CFA’s official image gallery”, this site provides pictures of CFA events and incidents.
- VicRoads ( <http://www.vicroads.vic.gov.au/Home>)- Volunteers use this site to monitor road traffic, knowledge of which is essential when responding to emergencies.
- OzFire ([www.ozfire.org](http://www.ozfire.org)) – Operating as a discussion forum with 886 registered users (as of 23 February 2007), this site provides information and photographs of Australian fire fighting.
- Fire Trader Australia ([www.firetrader.com.au](http://www.firetrader.com.au)) –Can purchase numerous fire fighting gear ranging from helmets to trucks and vehicles. Among many others, this site is a supplier to CFA, MFB, and the Victoria Police.
- Incident Alert (<http://www.incidentalert.com.au>) – A monitoring system which will alert its members of bushfire and incidents within CFA’s region of Victoria. Members have the option of being alerted via email, SMS, phone messages, and pagers.
- Metropolitan Fire Brigade (MFB) (<http://www.mfb.org.au/>)- An organization similar to CFA that operates in the metropolitan region of Melbourne, Victoria. Within this site, participants noted using the MFB active incidents map page ( <http://www.mfb.org.au/asset/html/IID/static/html/map-standard.html>).
- NSW Rural Fire Service ( <http://www.bushfire.nsw.gov.au/>)- CFA equivalent of New South Wales.

- Australian Road Rescue Organization (<http://www.arro.org.au>)- CFA sometimes works in close association with this organization during fire fighting operations.
- <http://www.iffd.net/> - A site dedicated to International Firefighter's Day (May 4)
- A page with links to brigades with websites was requested. This page already exists at <http://home.vicnet.net.au/~cfabrig/>.
- lots of various live pager streaming sites
- Add the live feeds website found in the emails

Many volunteers mentioned they use the Department of Sustainability and Environment (DSE) site frequently for the fire updates. These fire updates are provided in a map on the site. The site contains a map of Victoria with constant fire updates placed onto the map. Visitors can hover the pointer over a fire shown on the map and get information on the fire. Since many volunteers requested better maps and more in-depth information on fire updates, a map similar to the one on the DSE website could be implemented on *Brigades Online*. Volunteers also asked for weather updates, such as rains, temperatures, and winds, on the site as well, possibly in map form. Information on the current regional and statewide positions of trucks was always requested, so a combination map with weather, fire updates, and positions of trucks on a live feed would surely satisfy many volunteers and possibly deter them from using other sites such as DSE and BOM.

Many survey responses stressed a desire to connect more with their fellow volunteers. These connections can be made in various ways. One idea would be for CFA to add a "CFA in the News" section that features various brigades and individual volunteers who make the local newspapers or TV shows. This section could also include events and fundraisers that CFA volunteers host depicting the pride each brigade has for their particular community.

The desire to correspond with other volunteers was strong, as volunteers also requested the addition of a discussion forum. Another site commonly used by volunteers is CFA stream ([www.cfastream.info](http://www.cfastream.info)), a site dedicated mainly as a discussion forum for CFA volunteers. Here,

volunteers from different regions can talk about CFA issues and current events. Many participants mentioned liking the site because they can get direct news and incident reports concerning other regions from other volunteers. It was suggested that *Brigades Online* develop a regional and statewide discussion forum for volunteers. In view of the fact that CFA is a government organization, a discussion forum for all volunteers would have to be strictly monitored and may be implausible. It was also suggested that a forum be established for Secretaries, Administrators, and Captains only. The forum could be regional or statewide and could enable positions involved to receive updates and pass them onto their brigades.

Individual brigades often have their own websites. These websites are sponsored by the brigades themselves and are independent of *Brigades Online*. It was suggested that *Brigades Online* open a section of their site up to host individual brigade sites. The Secretary and Administrators of the brigades could maintain these sites. Knowledge of web design would not have to be known because CFA could ease the process of web layout by designing the section so that brigades would only have to enter information into a template. When a volunteer logged into *Brigades Online*, the option to be sent directly to their brigade site could be made available as well. On the site, the secretary could post important documents, training records, news, and other items concerning only the individual brigade. In this manner, those volunteers who miss meetings would be able to access the minutes of the meeting on *Brigades Online*. Other aspects mentioned for the brigade site include a contact list for the brigade and a comments and questions section. Correspondence between brigade members, distribution of material, and Section 29's would be aided by such an addition to the site.

Several volunteers called for a more personalized version of *Brigades Online*. The brigade website idea discussed prior would surely appeal to these participants. By combining

requests for brigade sites with those concerning a more personalized website, a tiered website begins to take shape. Such a layering of the website was suggested by one participant. The website would be layered based on the personalization of each section. In the most personalized section, there would be a page for each volunteer. On this page, volunteers would have the opportunity to change their contact details and see their training records. Volunteers already have access to these functions, but the participant believed these options should all be located on one page. It was also suggested that each volunteer be given a web-mail account to make the distribution of news and other information easier. The second layer of this hypothetical arrangement would be the brigade sites discussed earlier. On the third layer, a more detailed regional aspect of the site should be maintained. Regional news and incident reports would be included in this tier. The fourth layer would encompass the entire state of Victoria. The type of information included in this layer would be similar to that of the regional layer. A fifth layer could also exist in which national fire related incidents were presented. This suggestion would require a detailed reorganization of the site, something CFA may not be willing to attempt. It is important, however to note some ideas included in this layering.

The distribution of web-mail accounts was suggested by multiple participants. Aliases could be set up by region, brigade, and position so groups could selectively receive notifications and information. If the distribution of numerous web-mail addresses was impractical, it was also suggested that Secretaries, Captains, and/or Administrators receive email addresses. This suggestion came from a supporter of brigade websites. The participant was able to link the ideas together in that if Secretaries were given web-mail accounts, he/she could distribute the necessary emails on the brigade website. In this way, volunteers would receive the notifications and news sent to Secretaries, avoiding unnecessary clutter.

Participants also requested the addition of live regional and statewide radio feeds. One participant remarked that he used to listen to police and ambulance radio dispatches but stopped when they went digital. It was from these dispatches that he acquired much of his news regarding the current fire situations in his region. The addition of a page with a live-dispatch was suggested as well. This page should have the ability to be toggled to display pager calls by region. In this manner, volunteers could view live occurrences throughout their region or state of Victoria.

Along the same line as live-dispatch feeds, participants also requested the addition of a live pager feed. WebPages already exist which show live pager feeds for certain regions, but are not sponsored by CFA. Many of these sites have recently been shut down however due to threats of legal action by the Department of Justice for distributing confidential material to the public. A page with live pager feeds by region would enable volunteers to follow live pager messages in each region and be constantly updated on emergency responses.

Not all suggestions were as complex as the ones previously discussed, nor could they be linked to any of the prior ideas. Nevertheless, these suggestions are still noteworthy and should not be ignored. One insightful idea was the addition of a suggestion box to the site. Through the course of the interviews, a few participants mentioned that they use CFA Pix, a website separate from CFA which has pictures pertaining to CFA events. It was suggested that *Brigades Online* incorporate more picture galleries and possibly videos onto their site of fires and other current and previous activities. There should also be a section where volunteers are able to submit their own pictures of CFA activities. The participant noted that *Brigades Online* has a real “business feel” to it and pictures may help lighten the mood of the site.

A few users suggested that navigation around the website is difficult and can be confusing at times. They stated that they used the site map feature often when logging on to *Brigades Online*. Many volunteers believe the navigation system involved with the site is outdated and needs to be revamped. Possible remedies offered for this problem included the addition of a better search engine and a reorganization of material on the site. Some stated that the menu system on the site should be improved and possibly a drop down menu added. Numerous complaints about the search engine were also received. Two participants requested that an information packet of some kind be added to aid new users with familiarization of the site. A possible deterrent from use of *Brigades Online* may be an inability to use the site properly or at all. The addition of a basic introduction to the site when first registering with a tutorial of the utilities available may be a viable solution.

Participants also complained about the amount and particularly, the detail of news posted on *Brigades Online*. Volunteers asked for more news regarding current fires and more regional news, perhaps even a news page for each region. Complaints regarding the detail of news provided were mainly concerned with the minimal difference between news provided on CFA's public site and on *Brigades Online*. Volunteers believe they should be given more detailed information than the public receives. Users may not be logging into *Brigades Online* since they can access the same information on fire incidents and news on CFA's public site. One participant expressed that volunteers should be able to access the incident management system (IMS) on *Brigades Online*.

The lack of statistical analysis was also addressed by a participant. He requested a section be included in *Brigades Online* which analyzes fire incident reports. Brigades submit FIRS reports, but do not get any feedback on what is done with them. The participant requested

that data such as amounts and percentages of where fires start, how they start, why they start, and when they start be expressed somewhere on the site. Not only would this inspire volunteers to frequently submit more detailed FIRS reports but may also inspire volunteers to become *Brigades Online* users to see the FIRS analysis.

#### **4.5 Limitations and Error**

The recognitions of limitation and error in the collection of the data and the analysis of results are critically important to increase the overall validity of research findings. It is also important to acknowledge alternative interpretations and viewpoints. In conceding uncertainty, the project group can make conclusions more credible (Barnett). The largest area exposed to limitations and error was that of the survey methods and results. Survey methods and results were limited primarily by time, resources, and the number of volunteers willing to participate.

Limitations existed in construction of the sample size representative of the overall volunteer population. The project group was only given access to demographic data regarding gender, age, and region. Information on user activity was not provided to the project group until the final stages of the project. Since this information was not readily available when the representative sample size was created, the project group was only able to control how many of each gender, age, and region were to be called in proportion to the real volunteer population. Prior to making calls, the project group was not able to control if the volunteers that were being interviewed were *Brigades Online* users. This have been a cause for the surplus of users as compared to CFA projections or a lack there of, depending randomly if the persons interviewed used the site or not.

Analysis of the phone surveys revealed to the project group that of the 500 volunteers interviewed, 40% were found to be *Brigades Online* users. Controversially, CFA records show

that 18% of all volunteers are users. The project group had found user data of phone surveys to be wide of the mark by a factor of 2. Possible causes for this inaccuracy could be due to interview bias of the Captains of each brigade. Before the project group could call volunteers, they had to obtain permission from each Captain. The Captains would then direct the focus of the the project group' interviews by telling them who would be easy to talk with in their brigades. Captains related easy interviews with people that would be familiar with *Brigades Online*; this decision could have potentially led to a greater number of users in the sample size. Some Captains denied permission to interview their brigade members. The project group could then only interview brigades where Captains either did not care if their brigade was interviewed or felt that their brigade would be easy to interview, which introduced a bias to the results. Again, this ease of interviewing may have been related to brigades containing more *Brigades Online* users than non-users.

Limitations existed further in the regulation of CFA member position proportions when interviews were conducted. The total volunteer population in the state of Victoria is approximately 60,000 people. The sample population chosen for analysis was 500 people or less than 1% of the total volunteers. The sample size was representative of the overall population, but it was such a small fraction that it hindered overall accuracy, making it impossible to be completely precise. The reason for the small sample size was because when constructing a representative sample size the project group was not able to accurately relate the proper proportions of CFA member positions. When the project group constructed the representative sample size using gender, age, and region, they were left with fractions of members that were to be called from each of the previously mentioned categories. These fractions were rounded making whole numbers of people. If the project group had broken down the demographics



further by adding CFA member position, then those fractions of members would have been so minute that they would have been rounded to zero instead of a number that the project group could interview. Thus, the project group did not include CFA position as a control for calling volunteers, but rather just fulfilled member gender, age, and region requirements.

Limitations also existed in gathering contact information from CFA databases and in physically calling volunteers. CFA databases contained substantial errors in contact information which the project group had to sort through, further limiting time to gather surveys. CFA databases were unable to display all contact information on the same webpage, so the project group had to collect names and then look up contact details using another database provided. Mistakes could have potentially been made in the process of gathering contact information.

When calling volunteers, further restrictions were discovered. Ultimately, any phone survey will still contain a certain degree of randomness, as the only knowledge of the participant prior to calling was gender, age, and region. Although the survey is still random because their answers to the survey cannot be predicted, the willingness of the participant to take the survey is a trait that influences their answers. A volunteer's willingness to participate in a phone survey may translate also into a willingness to use *Brigades Online*. Furthermore, when volunteers were contacted, surveyors announced at the beginning of the call that they were from CFA Headquarters. As the people called were CFA members, they might have had a tendency to exaggerate their responses. Possible causes for this may have been related to the desirability of the subjects interviewed to impress surveyors in telling them that they responded more often to emergencies or logged into *Brigades Online* more than they actually were. The project group could not check to see how often members responded to emergencies, but they could check to see the last login date of users. When examined, it was found that 3 out of 40 volunteers'

information regarding login frequency was inaccurate. As this is 8 %, the project group conceded some uncertainty in the validity of volunteer login frequency given through phone interviews.

Another limitation of phone surveys was that the project group could not regulate the time of day and/or season when interviews were conducted. It was discovered that volunteers were more prone to answer their phones and agree to participate if the interview was done in the afternoon hours of the day. Possible causes of this behavior could be because most volunteers have other jobs, which take priority over CFA responsibilities. Volunteers would primarily be working their other jobs during the day, thus leading to a minimization of volunteer participation early in the afternoon. Inversely, members who had other jobs that required attention in the afternoon would not be likely to participate in an afternoon survey. Since surveys were then conducted mainly in the afternoon through late afternoon, survey data was largely composed of volunteer interviews that were collected from members available at those hours of the day. The project group also had no control over the time of season when interview data was collected. Fires are more likely to occur in the summer months when climates are generally hotter and terrains are drier (Symons). Since the project research was done over the summer months more volunteers were responding to emergencies on a regular basis. This fact could have potentially skewed survey data, either due to a lack of available volunteers willing to participate or, a surplus depending on the frequency of fire related emergencies on a daily basis.

The surveys obtained online and through postage mail contained many of the same limitations as those gathered from phone calls. The perception that the survey would be able to reach all volunteers across the state of Victoria is false because only users who had access to *Brigades Online* or were informed about the survey on *Brigades Online* could participate. This method of surveying produced a very inaccurate model of the actual volunteer population in

Victoria. The total pool of volunteers was automatically narrowed down to those who had computer and Internet access or associated themselves with someone who did. Further limitations existed because the the project group had no control over how the questions would be interpreted and subsequently answered by those volunteers who met the previously mentioned requirements. It should also be noted that those who made the effort to answer the survey could have been motivated to do so by sheer willingness to help or the desire to win the \$100 gift certificate. As stated prior to analysis of these surveys, the the project group took these facts into consideration before making any claims about the trends in the data.

Human error should also be recognized in the form of research, surveyor, participant, and calculation errors. Research error may have occurred when gathering and interpreting information. Error may have transpired by surveyors if they did not use the same phrasing of words when speaking to the participants. Participant error may have arisen if they provided false information when being interviewed. Calculation error may have happened when organizing and analyzing the data. All of these errors could have potentially skewed research data producing false claims or assumptions.

The most significant limitation of the study was the inability to contact certain brigades because permission to contact the brigade was not given by its captain. When looking at brigades whose captains did not give permission to interview, it was found that 13% of members in each were users. CFA records showed that 40% of the survey participants were users. If all brigades contacted were allowed to be interviewed, an estimated 27% of the potential participant would have been users. This value was calculated by averaging the usage percentage of members unable to be interviewed due to lack of permission with those interviewed. The project group also checked CFA data to validate participant responses. Through this process it was found that

5% of participants said they were users yet did not have accounts according to CFA data. This statistic may exist because members are using others' accounts. Participants were asked whether they were Brigades Online users, not if they actually had their own account, a flaw recognized by the the project group while analyzing the data and an unfortunate limitation of this study. Since the sample size is representative of the total population, 5% can be subtracted from 27%. This gives a final statistic that 22% of the potential participants are Brigades Online users with accounts.

## 5 Conclusions and Recommendations

The goal of this project was to establish recommendations for Country Fire Authority (CFA) of Victoria, Australia, concerning the increased usage of web-based services for their volunteer members. The primary objective was to evaluate the current members' only website, *Brigades Online*, and create guidelines for further development. The project group gathered factual information from CFA members. Five hundred volunteers were interviewed, providing the project group with a representative sample size of the overall population. Data was analyzed examining trends and unique opinions. Key findings emerged and were summarized so conclusions and recommendations, regarding usage optimization of Brigades Online, could be drawn from them.

Results showed that the most used part of *Brigades Online* was Training Records / Training Course Information, where 83% of volunteers used it. The least used parts of the site were Brigade Inspection Information (Section 29), drawing 18% usage, and Dress Protocols, with 19% usage. Results showed the rest of the site shared similar usage trends. Since the rest of the site drew comparable usage it would not be necessary for CFA to attempt to improve individual sections but rather improve the site as a whole. The two least used sections will never be popular

because of the nature of their contents. Brigade Inspections only occur once a year so CFA can not hope to have users logging in frequently to a section regarding inspections and dress protocols very often. CFA should improve the site as a whole with a focus on the improvement of the accuracy of personal data and training records.

Results also showed that the most frequent users of *Brigades Online*, relative to their positions, were Captains and Secretaries. Although this may be intuitive it is still important to consider that these two positions have the most frequent BOL usage. Possible reasons for their high rates of usage could be that the rate at which *Brigades Online* is accessed is affected by volunteers' involvement within their brigade.

To increase overall BOL usage CFA should target Lieutenants, Firefighters, and Members. Many of the results showed findings that were ultimately intuitive. The closer a region to an urban area the higher the amount of BOL users there were. This coincides with CFA user approximations regarding region. This also relates to frequency of emergency response as urban regions and their surrounding areas have more emergencies to respond to than those of rural regions. Moreover, there is a direct correlation between emergency response rate and *Brigades Online* usage. Volunteers, who respond to emergencies frequently, daily or weekly, are most likely to be users. Since this demographic already has the most BOL usage, CFA should focus on members that don't respond to emergencies often, enticing them to increase or begin usage. If CFA should seek specific information regarding the improvement of its site then they should consult volunteers who respond to emergencies frequently, as they tend to be the most frequent BOL users. Interestingly there was no correlation between frequency of emergency response and BOL login regularity. For volunteers that respond to emergencies most often it didn't effect how often they signed onto BOL.

More specifically, a possible market potential was identified. Results showed that the position of “member” has the utilization rate 48% of every other position. In order to address this issue, the authors recommended that efforts be raised to press more education of *Brigades Online* towards: “members”, frequent Internet users, and volunteers who are unaware of *Brigades Online*.

The number of people that have computer/Internet access was found to be surprisingly high. When computer access amongst volunteers was analyzed, results showed 8% (41 volunteers) did not have access to a computer. Out of the 92% that had access to a computer, 95% (436 volunteers) had access to the Internet; meaning 87% of the total volunteer population had Internet access. Results showed 70% of volunteers with Internet access had a connection speed equivalent to Broadband or faster, leaving 30% with dial up connections. Interestingly, results displayed that Internet connection speed did not influence login frequency.

Results showed that 35% of *Brigades Online* non-users, who have heard of *Brigades Online*, are users of other CFA websites. Moreover, it was found that 60% of non-users often use the Internet, and these non-users make use of CFA public site and/or others instead of BOL. Upon analysis of the surveys, it was noted that five websites were being used more often than others. In order of most used to least, these websites include: Bureau of Metrology (BOM), Department of Sustainability and Environment (DSE), CFA public site, Google, and CFA stream. This is important to make note of because if volunteers, potentially having access to BOL, chose to use CFA’s public site or other sites instead of BOL then there was something being offered to them that BOL cannot provide. Furthermore, if BOL was providing it then it could be found somewhere else where it was easier to access and/or use.

It is important to address why volunteers are accessing other websites instead of BOL as this ultimately lowers BOL usage. There was a general sense that these sites were used because of superior technology or more useful information. Results showed that volunteers logging into the BOM website most used the site for its weather updates. Volunteers logging into DSE most accessed the site for its interactive fire incident maps, which display current fire locations and their severity. Volunteers used CFA public site to get updates of what's going on in CFA. Members used Google for its search engine and they used CFA stream to communicate with other members about various issues. CFA could use this information to add new features such as weather updates, up-to-date fire incident maps, more easily accessible updates of what's happening in CFA, a better in-site search engine, and a communication tool linking members together.

The desire to correspond with other volunteers was strong as results showed similar opinions regarding this matter. A possible tool linking members together would be some type of regulated discussion board that let members discuss things relevant to CFA but important to their interests. Results found that many users found BOL confusing and hard to find things.

A better search engine should be implemented to make finding materials easier. To ease overall BOL navigation results showed that some type of tutorial could be helpful when users first logged in that explained how to use the site and what was available for use. This could also be linked with a recent updates prompt that would show existing users what's currently going on in CFA. These update prompts should include drop down menus that show users what materials can be found under each section instead of having to first browse away from the front page to see what's available. Navigation through BOL should include history sidebars where users can see where they have come and could navigate backwards if needed to avoid getting lost in the site.

Further supporting evidence for a complete overhaul of the site is that there has yet to have been any major renovations to the site since its development in 2001. Moreover, there was broad support that it would be useful to improve the ease of use of the website. By making the site more navigable, volunteers would use *Brigades Online*, instead of other CFA websites.

However, it would be important for CFA to investigate this matter further by conducting another study in which BOL users and non-users were contacted and asked if some of these utilities were offered would it entice members to login BOL more often.

Results further provided unique suggestions for the site that should also be included in an additional follow up survey. Some of the most popular volunteer suggestions included: the personalization of BOL to individual users, advertisement of BOL to regions with known low usage, more download and upload BOL capabilities, and possible technological donations that would give brigades interested in online usage access that could not previously afford it.

Personalization of BOL for individual users would include capabilities of individual brigades uploading their personal web pages and having CFA host these sites so that when users logged in they would be greeted with information relevant to them individually. Individual brigade officers and administrators would be responsible for managing and updating these front pages and as well be responsible for content. If this was later deemed not plausible then at minimum links should be provided to individual brigade websites as well as relevant sites in general. This would give users far more resources available from BOL and might cut down on foreign site usage without BOL usage. There already exists an external links section on *Brigades Online*, but it is very hard to find, and many volunteers do not know it is there. CFA should advertise to regions of known low usage because the majority of people in these regions have never even heard of BOL. Volunteers that have never heard of BOL cannot be responsible for not using the



site as they didn't even know that it existed. Advertisement would help spread the word that BOL is available for member access and theoretically promote overall usage. Related to this issue would be CFA donations of small technological supplies to regions that felt would use the Internet if it were provided for them. Small donations could possibly encourage spikes in usage as volunteers would share access. Hypothetically an entire moderate sized brigade could use one computer. CFA should also enable users to upload and download selective material such as how Fire Incidents Reporting System files can be viewed online yet cannot be submitted online. Eliminating more paperwork would ultimately push for more technological usage and may force volunteers to use BOL more often. Moreover, results implied that if *Brigades Online* incorporates more picture galleries and possibly videos onto their site of fires and other current activities that it may potentially lessen the overly professional image of the site and thus make it more users friendly.

Overall potential improvements should be further researched analytically through a follow up survey that includes all common and unique recommendations. Provided enough interest from volunteers CFA should implement these recommendations to improve not only site usage but also general BOL improvement as a whole. Action is needed, as the site hasn't endured a major renovation since its creation. Also, a revamping of the website would provide CFA with the chance to market a new and improved website adding much needed interest to volunteers who are users and non-users. CFA needs to adapt with changing technology in order to maintain status in an ever-shifting environment.

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# Appendices

## Appendix A – Survey

- = Questions to be asked to Users (i.e. flow of questions asked if answer to #1 is Yes)
- = Questions to be asked to Non-users (i.e. flow of questions asked if answer to #1 is No)
- = Questions to be asked to both Users and Non-users

1. What is your gender? (don't read it off)

- a. Male
- b. Female

2. How old are you? (don't read it off)

- a. Less than 18
- b. 18-25
- c. 26-34
- d. 35-44
- e. 45-54
- f. 55-64
- g. 65 and older

3. What is your highest level of education reached? (read it off)

- a. High School
- b. TAFE
- c. University
- d. Post-grad
- e. None of the above

4. In what region is your Brigade located? (don't read it off)

2    4    5    6    7    8    9    10    11    12    13    14    15  
16   17   18   20   22   23   24

5. What is your position in CFA? (read it off)

- a. Member
- b. Operational Member, i.e. Firefighter
- c. Secretary
- d. Lieutenant
- e. Captain

6. How often do you respond to emergencies? (read it off)

- a. Daily or multiple times a day
- b. Weekly or multiple times a week
- c. Monthly or multiple times a month
- d. Fewer times than the above

e. Never

7. Do you regularly have access to a computer, i.e. at least once weekly? (don't read it off)

a. Yes

b. No

8. If Yes to Question #7, do you use your computer? (don't read it off)

a. Yes

b. No

c. Other

9. If Yes to Question #7, where do you have access to a computer? (read each one off, pause to circle as you go)

a. At home

b. At work

c. At the Station

10. Do you have Internet access? (don't read it off)

a. Yes

b. No

11. If Yes to Question #10, how often do you use the Internet? (read it off)

a. I am always using the Internet.

b. I use the Internet at least once a week.

c. I use the Internet at least once a month.

d. I never use the Internet.

12. If Yes to Question #10, how fast is your most used connection speed? (read it off)

a. Dial-up

b. DSL, Broadband, Cable

13. Are you a current *Brigades Online* user? (don't read it off)

a. Yes

b. No

14. What type of access to *Brigades Online* do you have? (read it off)

a. Regular / Member

b. Brigade Support – (i.e. not given out very often)

c. Brigade Management – (i.e. every Captain and Secretary)

d. Brigade Administrator – (i.e. can set and re-set passwords; very rare; typically the Secretary or IT person)

15. Do you know what *Brigades Online* is? (don't read it off)

a. Yes

b. No

16. If Yes to Question #15, why are you not using *Brigades Online*? Force people to elaborate on their experiences

17. How often do you sign onto *Brigades Online*? (read it off)

- a. Yearly
- b. Monthly
- c. Weekly
- d. Daily

18. For which of the following reasons do you use *Brigades Online*? (read each one off, pause to circle as you go)

- a. Maps
- b. Service history and awards
- c. FIRS Reports
- d. Access to the “bookshelf” / Document management
- e. Training records / Training Course information
- f. To check or update brigade membership listings / contact information
- g. To check the latest news and media releases (Fire Flyer newsletter)
- h. TFB and Fire Restriction information and updates
- i. Vehicle information and updates (CSESP)
- j. Brigade inspection information (Section 29)
- k. Dress protocols
- l. Other

19. What do you like most about the site?

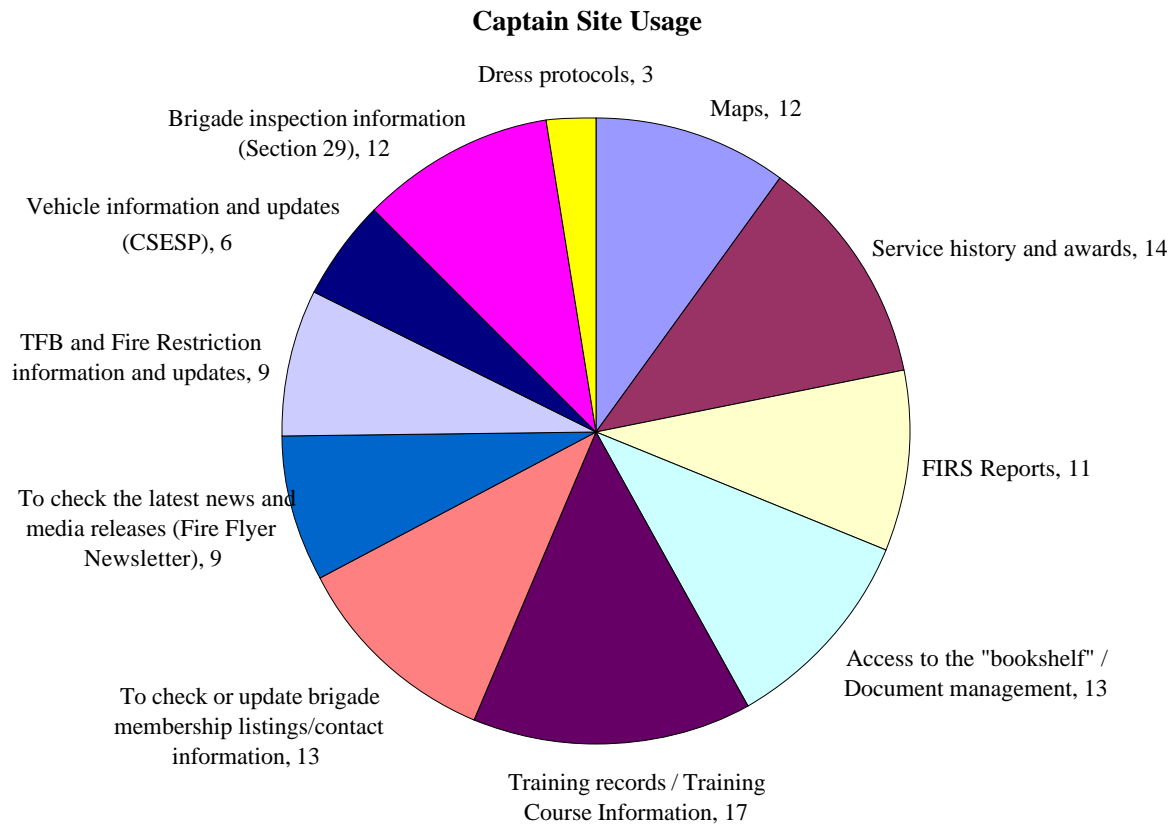
20. What would motivate you to use the site more?

21. Do you have any other suggestions for the site?

22. What websites do you visit that interest you and why, specifically, the URLs or web addresses? (e.g. content, visual appeal, check weather, news, finances)

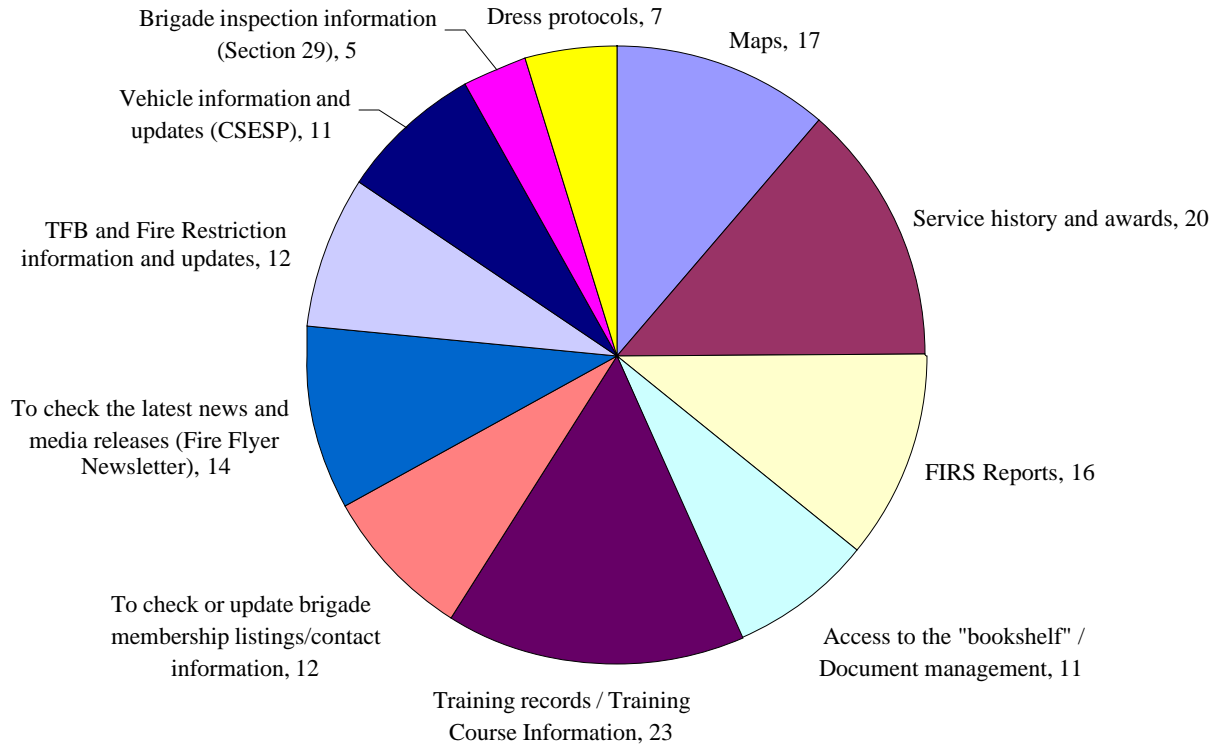
23. Comments

## Appendix B – Site Usage by Position Pie Charts

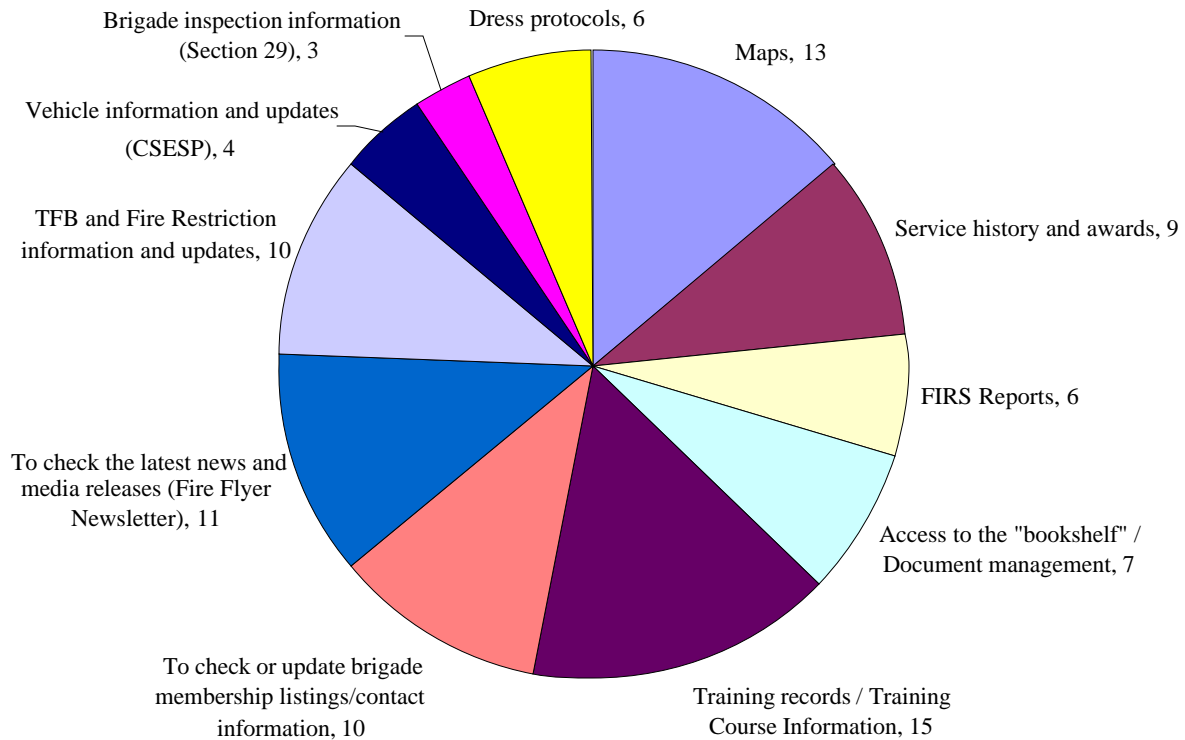




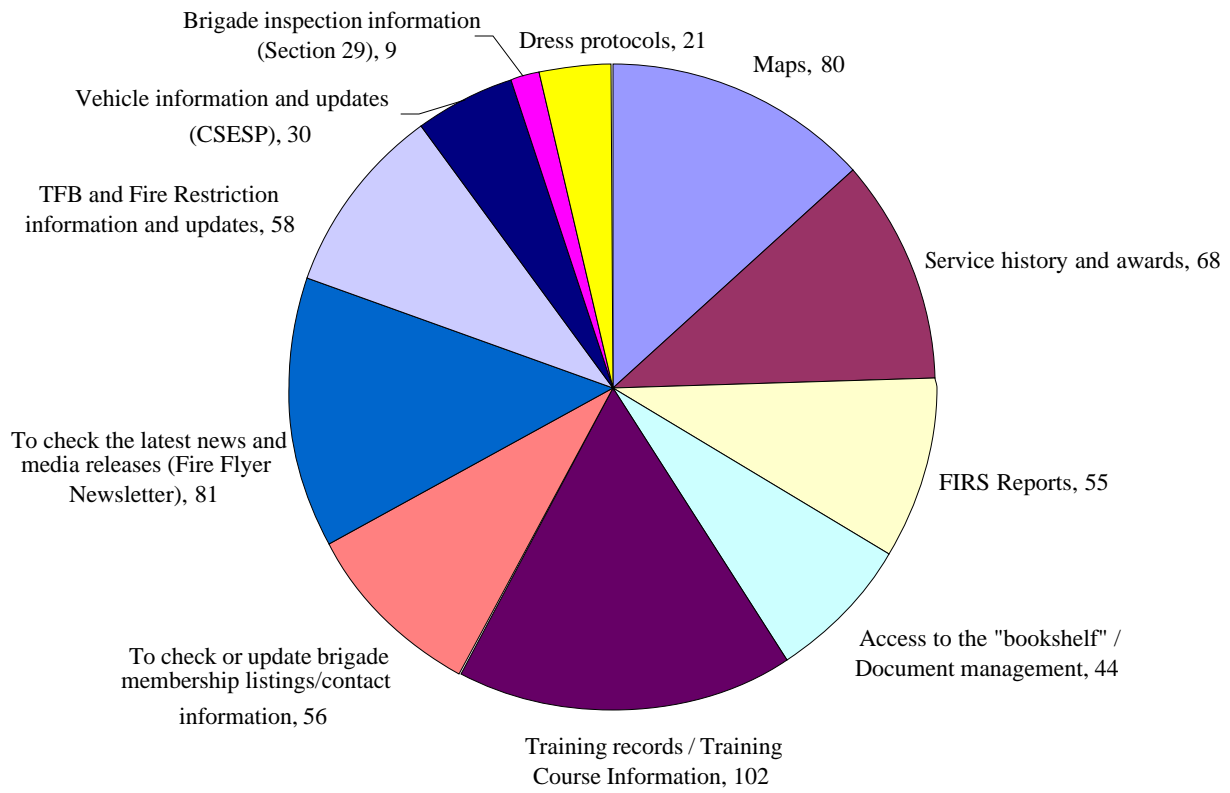
### Lieutenant Site Usage



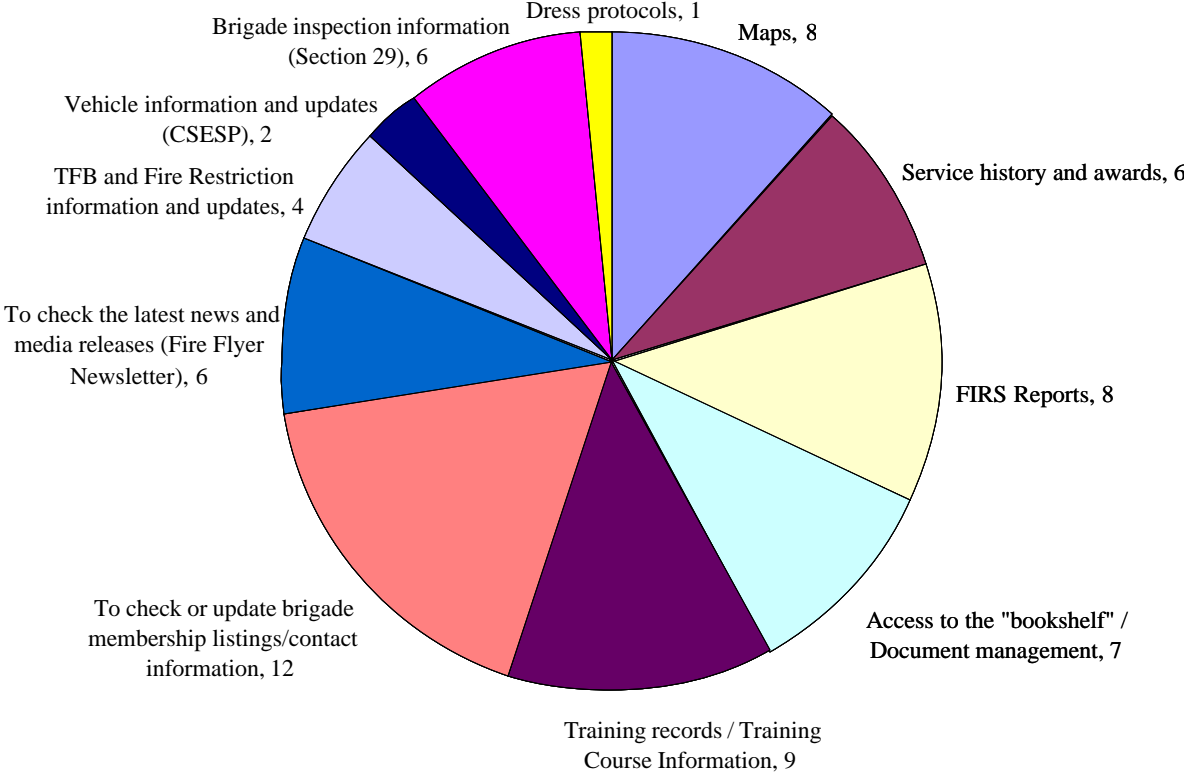
### Member Site Usage



### Firefighter Site Usage



**Secretary Site Usage**



## Appendix C – Survey Flow Chart

