

**Methods for determining the need for a Third Fire Station in the Northwest Section
of Violet Township**

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A proposed research project submitted to the Ohio Fire Executive Program

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CERTIFICATION STATEMENT

I hereby certify that the following statements are true:

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

2. I have affirmed the use of proper spelling and grammar in this document by using the spell and grammar check functions of a word processing software program and correcting the errors as suggested by the program.

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ABSTRACT

The Violet Township Fire Department (VT) has dealt with increasing response times in the northwest section of the township over the past few years. The increase has made the department look more profoundly at methods to reduce the response times in that section.

The problem this research addressed was ways to decrease response times to the northwest section of Violet Township. The purpose of the study was to identify methods to reduce response time to the northwest section of Violet Township.

Descriptive research was conducted to answer the following questions:

1. What will happen to response times if a station is added to the northwest section of Violet Township?
2. How can traffic preemption devices add to reduction of response times?
3. How could staffing at an additional station affect the fire department?
4. What additional methods can be used to reduce response times in the northwest section?

The procedures that were used were a descriptive survey that were e-mailed to 631 members of the Ohio Fire Chiefs Association, a literature review and past statistics. The survey revealed that 13% of the departments that responded had problems with response times and only a fraction of them were addressing the problem.

Results compiled by this research indicated that the problems of decreasing response times to the northwest section of VT are going to be a challenge. The department needed to develop a master plan to utilize the results of placing an additional station and adding additional staffing to benefit the safety, efficiency, and effectiveness, and continue service to that area. Future researchers can build on these results to aid in their research of a similar problem.

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INTRODUCTION

Statement of the Problem

The Violet Township Fire Department (VTFD) is faced with the challenges of response times that come with the rapid population and growth affecting the northwest section of Violet Township. This has presented the department with problems that we must deal with to overcome the increased demands for service and traffic congestion. The organization wanted to keep the ability to deliver the best, most professional service possible in the safest manner and reduces response times. *The problem this study addressed* were how to decrease response times to the northwest section of Violet Township. Response times are a growing concern in today's fire service. We struggled with how to overcome the constant concern of the community to react to response times that are below average. The response times from current stations to the northwest section of the service area are not meeting the NFPA 1710 guideline or meeting our "*quality of service*" we want to offer.

Purpose of the Study

The purpose of this study was to research and determine methods to reduce response times to the northwest section of Violet Township. The research was used to address increased traffic congestion, the impact of staffing an additional station and improve the quality of service to the northwest section. These findings could help determine if an additional fire station should be needed in the northwest section of Violet Township to reduce the response times.

Research Questions

The research questions this study investigated by a descriptive research were:

1. What will happen to response times if a station is added to the northwest section of Violet Township?
2. How can traffic pre-emption devices add to reduction of response times?
3. How could staffing at an additional station affect the fire department?
4. What additional methods can be used to reduce response times in the northwest section?

BACKGROUND AND SIGNIFICANCE

Violet Township Fire Department currently has two stations and is investigating construction of a third fire station. Service is provided to approximately 30,000 residents in a 42 square mile area. The area consists of Violet Township, City of Pickerington, a small portion of the City of Reynoldsburg, and Canal Winchester. All these municipalities lie in the rapidly growing area of Fairfield County (See Figure 1).

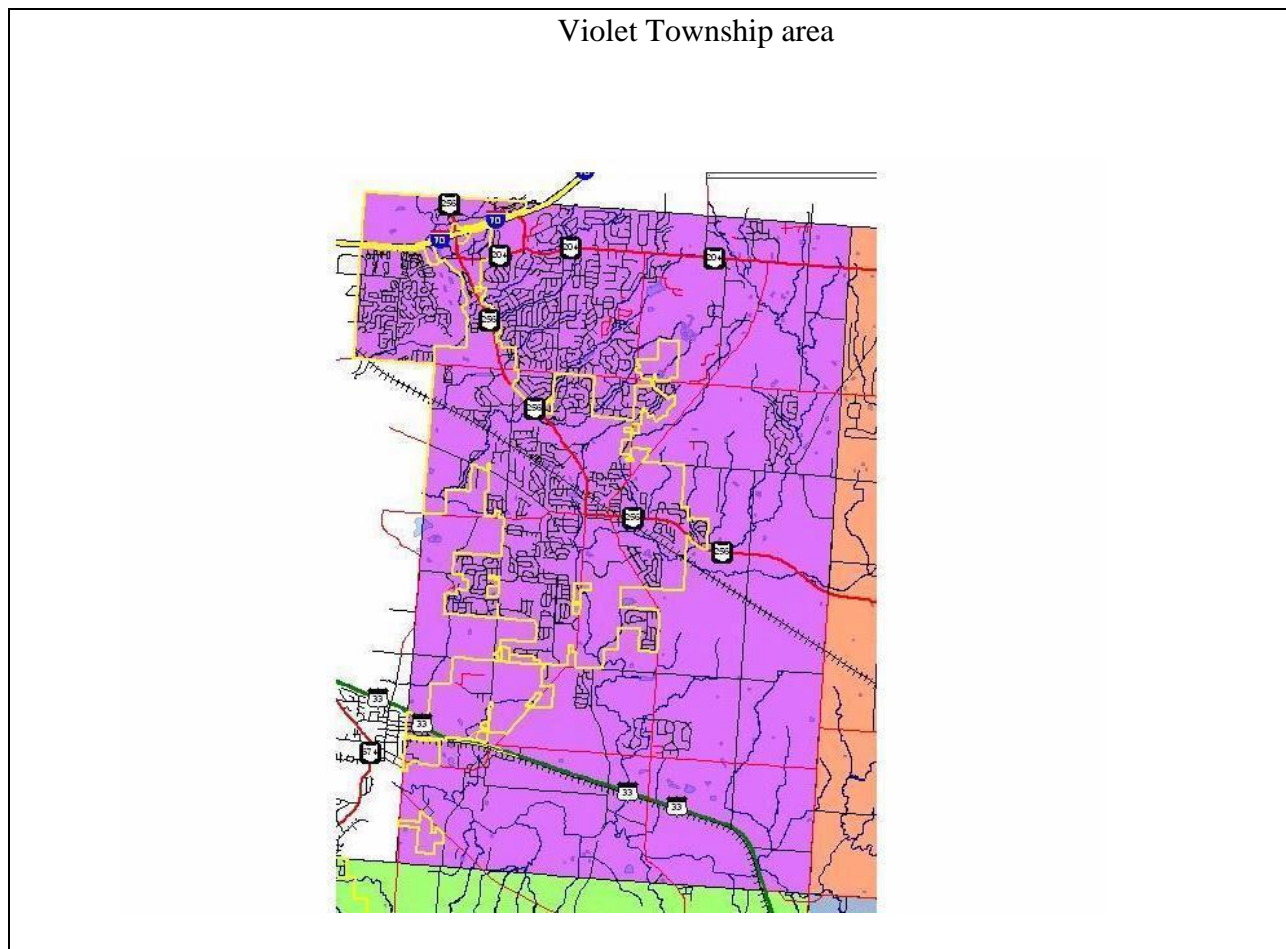


Figure 1.

Violet Township area in purple that covers the 42 square miles, with station locations and northwest section identified.

The fire department is currently experiencing increased run volumes in both EMS and Fire, to match the rapid populations, growth, and development. Figures from the Violet Township Fire Department, EMS and Fire year-end reports (Violet Township Fire Department 2003-2005) compiled by the VTFD administration assistant indicate the EMS and Fire run volumes have increased about 19% during the years 2003 until 2005. Approximately 1200 building permits have been issued in the service area according to the Violet Township (Violet Township 2003-2005), and Pickerington building departments (Pickerington, City of 2003-2005), during this period. According to Mid-Ohio Regional Planning Commission, Violet Township area is the most rapid growing in Fairfield County and is one of the top five in central Ohio.

The more that can be done to help our department be safe, not to mention our residents, the better VTFD will be able to continue a high level of customer service to our community. Traffic congestions are the most important issues affecting the response problem.

The northwest section has been the most rapidly growing area of our township in the last couple years. There have been numerous commercial and residential structures added to the area. Major department stores, restaurants, and apartment complexes make up the section. Population has increased along with amount of traffic that travels the roadways everyday, making it very difficult to have any kind of good response time to that area. The vicinity is relatively small, covering an area of about one and a half square miles with a major highway running through the middle.

With the current structure at Violet Township there are three 40-hour personnel. Staff includes a career fire chief, a career assistant chief and a fire preventions inspector. There are

three shifts of career firefighters consisting two lieutenants, 10 firefighters and a part-time firefighter, which all work a twenty-four hour shift. Two stations are staffed with this current level of personnel. Staffing is a concern if a new station were to be implemented in the northwest section. Increased traffic issues from the current stations are becoming a great problem and concern, illustrated by the approximate increase of about 4,000 new residents in the past three years. Alternative to these problems needs addressed. Staffing, traffic and response times will be researched to improve the quality of service that is provided. The following charts indicate that our response time from our current stations is greater than our acceptable levels, which is trying to commit to the NFPA 1710 benchmark (See Figure 2 and 3).

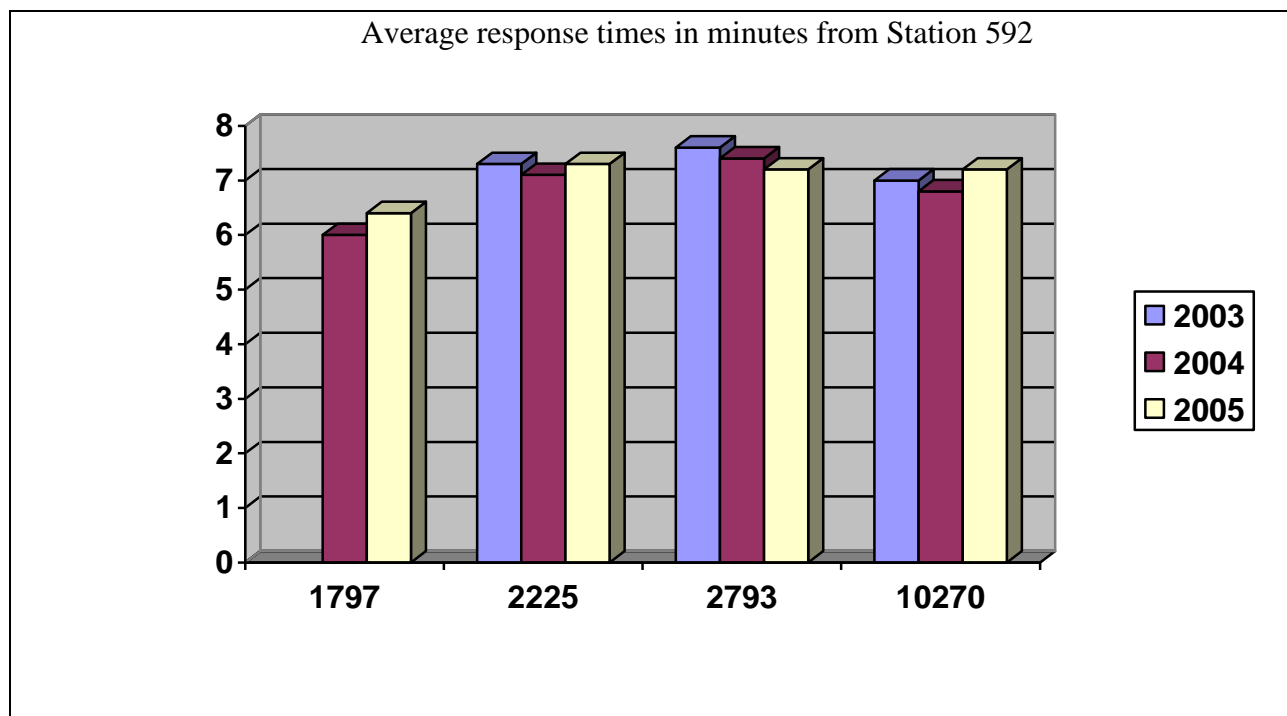


Figure 2.

Average response time in minutes from Violet Township Station 592 to the most visited addresses in the northwest section of Violet Township.

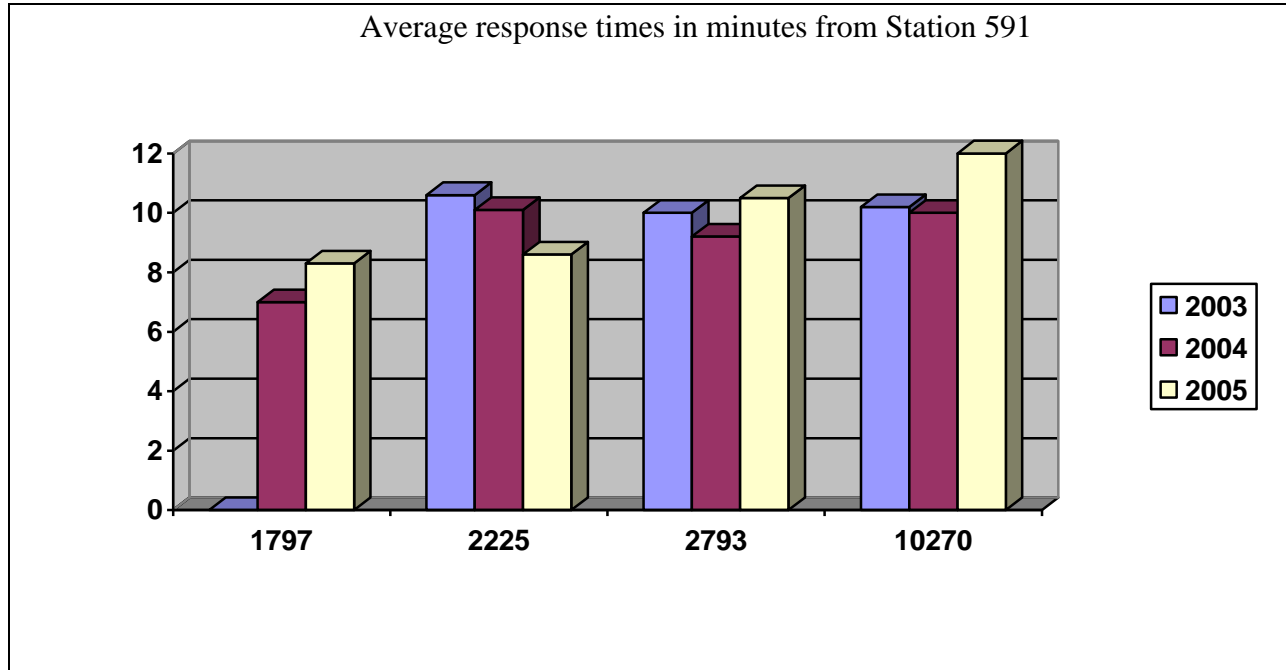


Figure 3.

Average response time in minutes from Violet Township Station 591 to the most visited addresses in the northwest section of Violet Township

Data further indicates that our area is growing and becoming a major problem is the approximate increase of about four thousand people that have become residents of our township and city over the past three years (See Figure 4 and 5).

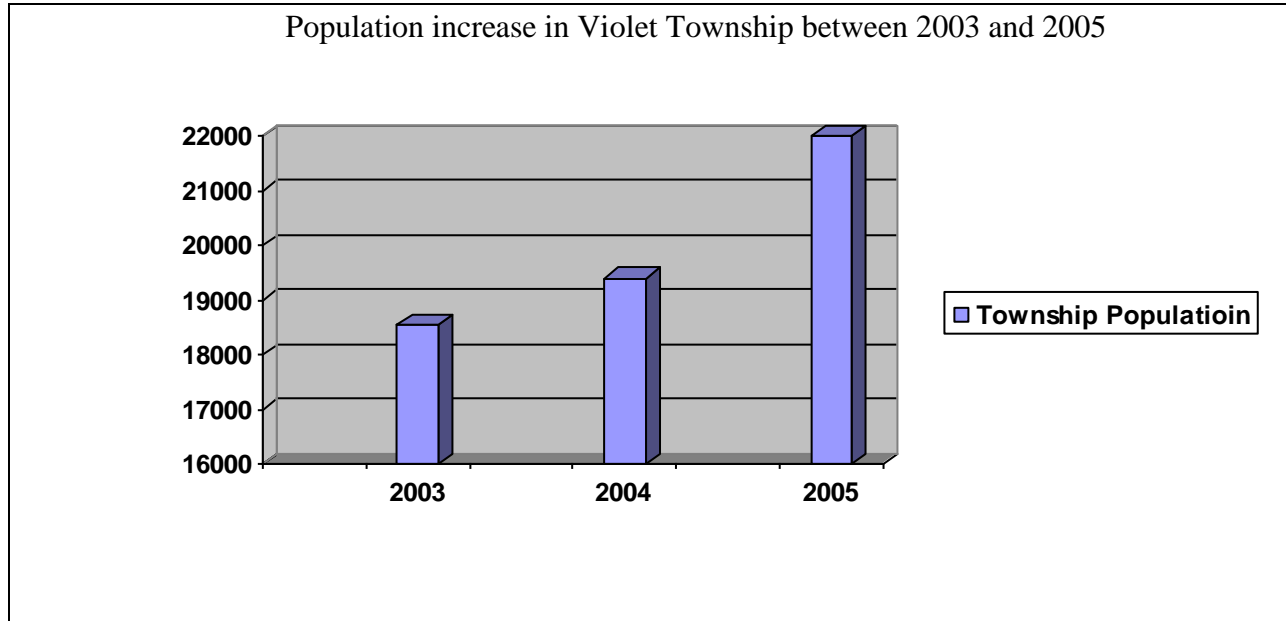


Figure 4.

An increase of population in Violet Township between the years of 2003 and 2005.

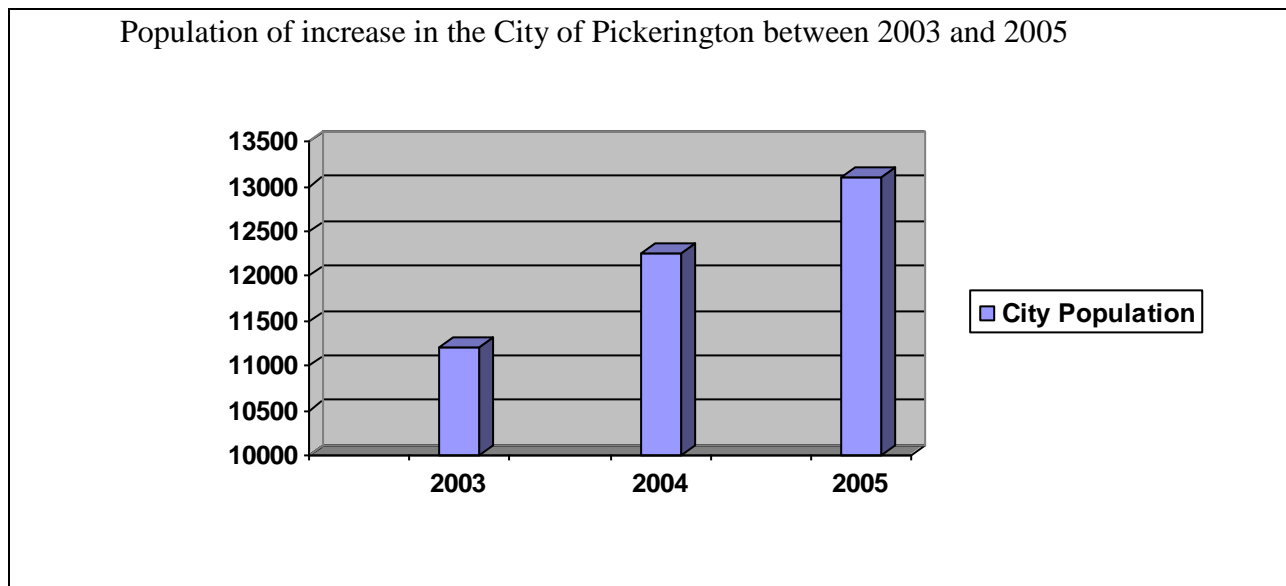


Figure 5.

An increase in population in the City of Pickerington between 2003 and 2005

The building of single family homes average about two hundred to two hundred and fifty per year and one hundred to one hundred and fifty multifamily residents per year.

With more residents, the school system has had an increase of approximately one thousand students over the three years (See Figure 6).

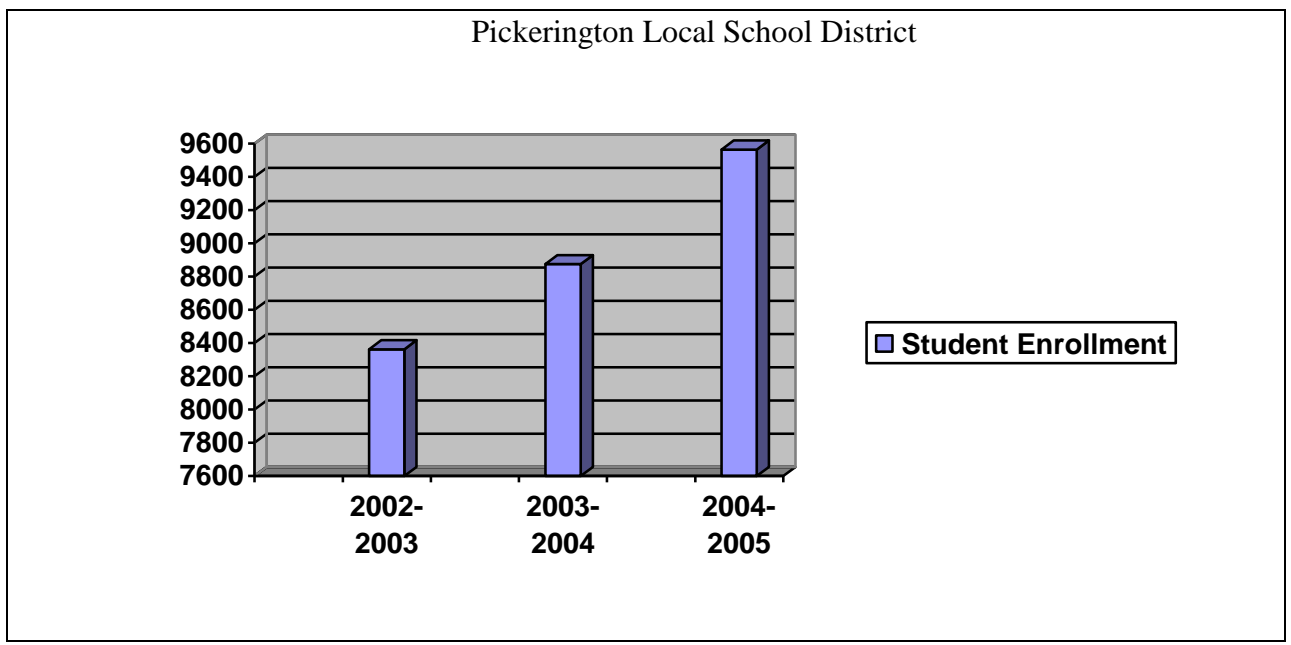


Figure 6.

An increase in student enrollment in Pickerington School District

VTFD participated in mutual aid or automatic response to the northwest section by the neighboring departments to help battle the traffic problems and get a quicker response to the community. But it is getting more difficult to rely on this due to the increasing runs of the other

neighboring departments. The department must address this issue and come up with a solution to solve the problem.

With these increasing statistics, as illustrated above, change in the way the fire service addresses the issues were strategically researched and implemented. It took a lot of research, analyzing, practice, and commitment to get change accomplished. The officers at Violet Township meet every other month to discuss various topics, problems, concerns, etc. The topic of response times in the northwest section seems to generate discussion frequently. During the past year there have been lengthy discussions on how to make the responses more efficient and safer. The discussions with some ideas such as putting a medic truck in a parking lot during certain hours of the day or night, going together with neighboring departments to develop a combined running district or station, and putting pre-emption devices on every light between the current stations and the northwest area. Pre-emption devices are an alternative way to helping traffic flow and decreasing response times. A lot of options have been explored but nothing of any real substance except putting an additional station in the northwest section to accommodate the current needs. This project has the potential to benefit the department and will help it keep up with the ongoing issues of responses and staffing with the increase traffic load in that area. If something isn't done to accommodate the impact of the issue in the northwest section, our responses will continue to increase and cause a further problem.

A survey was used to examine how other growing fire departments dealt with the ongoing concern of traffic congestion, increased response times and staffing. This study could have a positive result on how VTFD will address the problem and resolve the continual problem of increasing response times.

LITERATURE REVIEW

This author researches were obtained from the Fairfield County Library, periodicals, Internet sites and many journals and books for review. Officials from Violet Township, Washington Township, Lancaster Fire Department were personally contacted for information pertaining to response times, station location and pre-emption.

The literature review information was researched to answer the four research questions. The literature that was obtained for this research covers all four questions but some are more suitable for addressing the questions more directly than others.

Answering question #1 –*What will happen to response times if a station is added to the northwest section of Violet Township?* The author followed suggestions from the research.

Accomb (2002) discussed the aspect of selecting an appropriate building site for a fire station. He discusses availability, attributes, rule of thumb, and access to street, utilities and neighborhood input. All these are areas that will benefit the selection of a fire station. Article by Accomb (2002) seems to address all the aspects of building that are important to VT when searching for the correct location of building.

Cole and Russell (2001) discuss the future of a fire station. Three steps involved are strategic planning, preparedness, and education. They explain how these three steps make it easier to determine if it is more feasible to locate a fire station in correct areas or maybe just make modifications to existing station to improve response times. The three steps listed above by Cole and Russell (2001) is exactly what VT plans and has started to prepare for a new station to be located in the northwest section of Violet Township.

Coleman (2003) illustrates in the economic benefits that lead most communities to put fire stations right in the middle of their running area. However; when runs increase in other areas and response times are effected, there is a need to look at other alternatives to decrease run times. Adding a new fire station or combining with neighboring communities to cover the areas of slow response are options. The northwest section of Violet Township has developed to a great degree that a station could benefit in that area. Runs have increased, traffic has increased, and population has increased, so with the economic benefits that Coleman (2003) discusses are very accurate to what VT is experiencing.

Detroit Free Press (2005) published an article from the Boston Globe newspaper, which ran a series of articles pertaining to response times about the City of Troy Fire Department. The article tried to define the terms of response times and illustrate how the use of computer-dispatched systems can better track the actual times. They also illustrate how the proper distribution of fire stations in critical areas decreases response times. The article further discusses how data from specific locations corresponds with the areas protected. Finally, when a department is being proactive and reactive it will have an impact on citizen's safety. Violet Township is a very proactive and reactive department. The Detroit Free Press (2005) discusses ways that illustrates a concern for safety for their citizens just as VT does with their "Friends for Life" slogan.

Fire scope Inc. (2005) conducted a study on the City of Surprise, Arizona. The scope of the study was to see the impact on many areas that the fire departments chiefs outlined as problems areas. In their comparison they studied fire station locations, costs of fire stations, response times with both fire and EMS responses. They also looked at alternative service

delivery methods in the area. This study talks about all the areas that VT needs to address when addressing the need to improve the northwest section of the township.

Ludwig (2005) discusses the numerous and various ways that departments calculate response times. Are response times measured from time of call to actually arriving at a patient of fire scene? Are times measured from the time the trucks are rolling to the time that they stop at the scene? Time and level of service are the two basic principles of response times. What ever is established as a response time definition needs to establish the goals do meet the standards of NFPA 1710. The National Fire Protection Association develops standards for the Fire Service to follow on response times. Response times are very important to VT when trying to provide the citizens with the best possible care to them. When response times were discussed by Ludwig (2005) the time and level of service are very important to help meet NFPA 1710.

McLaughlin (2004) wrote about the growing pains of the fire service, both in residential and commercial communities. He stressed that a poll of fire chiefs found that communities are growing faster that they can keep up with and that this will tax the fire service. Strains will be placed on all aspects of the fire service from manpower and stations to water mains and apparatus. The article reports how ISO ratings will be affected due to the increased demand on services if the fire department doesn't keep up. There have been many strains that have affected the Violet Township FD, with the increase of commercial and residential properties in the northwest section of VT. Strains that McLaughlin (2004) illustrated are the same ones that concern Violet Township,

MTAS Consultants (1997) reported a management study of the City of Chattanooga Fire Department. This study addressed many areas with emphasis on fire station locations and staffing of those stations. Even though the study focused on a much larger fire department, it

still had some of the same problems and concerns as those of that a small department. This study is more on a much larger scale but MTAS Consultants (1997) but there are some good ideas when dealing with station placement and staffing.

First of all, the use of NFPA standards is just that a standard, guideline or benchmarks that gives a fire department a place to reference and research to try and make a respectable decision on an issue. The Violet Township Fire Department referenced the following NFPA guidelines NFPA (1201 and 1710, 2004) to help make a good decision on station locations, staffing, and decreasing response times by utilization of different methods. Below each NFPA guideline demonstrates how it is a reference for the Violet Township Fire Department to help answer research question number one.

NFPA 1201 (2004) standard for developing fire protection services for the public refers to and suggests aspects of community fire protection. Specifically the standard refers to management and supervision of fire companies and the fire/EMS staffing and stations.

NFPA 1201 (2004) sections 4.8.3 Design of Stations. “Emergency response stations shall be designed to meet the respective service demands in terms of space for practical utilization by apparatus and personnel”.

NFPA 1201 (2004) sections 7.3 Deployment of resources. “An ESO that provide fire suppression, emergency medical service, Haz Mat response or special operations shall develop and implement plans in accordance with NFPA 1710”.

NFPA 1710 (2004) standard goes into great much depth on the response time issues that the fire departments should try to meet. The standards are presented for fire departments to have a guideline as to how to improve their service.

NFPA 1710 (2004) section 5.3.3.4.4 contains minimum staffing numbers for ALS emergency responses.

NFPA 1710 (2004) sections 5.2.4.1.2 emphasizes the response times for fire suppression from initial response to crews on the scene.

NFPA 1710 (2004) section 5.2.4.2.1 emphasizes full alarm assignments on the scene within an established amount of time.

ISO is an institution that develops standards to direct a city or township develop a plan for response times within a certain area. They plan for a department to have a response of an engine company to be within 1-½ miles and a ladder company to be within 2 ½ miles of a built-upon area within city or township. At this present time there no recommendations made by ISO for ALS units when evaluating response times.

American Heart Associations (AHA) curriculum states that, the body will go from clinical death to biological death in 4 to 6 minutes with out oxygen. , (AHA Instructor Text, 2004). Early defibrillation and CPR are the key components to improve a victim's chance for survival during a cardiac arrest. Thus the importance of Violet Township Fire Department to provide quality service to the northwest section of the township buys providing vehicles to maintain these guidelines.

Answering question #2 – *How can traffic pre-emption devices add to reduction of response times?* The following research addresses this question.

National ITS Implementation Research Center researched a growing problem with traffic. They addressed congested roadways by measuring two types of preemption devices. The study looked at response times, traffic congestion, and response modes. They examined what was a priority and what wasn't. Their final conclusions listed cost, traffic disruptions and operation of

devises as concerns. The Violet Township Fire Department also looked at the cost, disruptions and operation upkeep of the devices to see if they are feasible to use and install in our current operation. Talking to other departments to see how they deal with pre-emption also helped with making a decision on traffic issues.

NFPA 1500 (2002) section 6 refers to with drivers and operators of Fire Department Apparatus. It identifies with different traffic rules and laws that should be obeyed. It will help understand the use of the preemption device. This is another guideline makes suggestions on how traffic rules and laws have an impact on the response times plus how pre-emption needs to be understood to make an impact on the problem.

Answering question #3- *How could staffing at an additional station affect the fire department?*

Baltic (2001) writes about the controversy of the NFPA 1710 standard. The article discusses the purpose of 1710 standard and what it is intended to do. It also describes how the committee went about getting the standard passed and how much money a municipality will have to come up with to meet the staffing standard of 1710. The response standard is labeled a benchmark and not a law. The 1710 standard can help local jurisdictions decide which direction they will pursue to meet their objectives. Critics and proponents of 1710 agree that knowledge of the standard is the starting point for any discussion.

Elliott (2001) illustrates the NFPA 1710 Facts, Fallacies and Fallout. He discusses the problems that are brought on by the standard, how certain people got the standard through and how people were left out of the development of this standard.

These two authors (Baltic 2001 and Elliott 2001) discuss the staffing standards of NFPA 1710. There are many pros and cons to this standard, so that's why one has to research all the

areas to determine if staffing will have any type of impact on a fire department or not. There is additional literature reviews that were illustrated earlier in this paper at were related to question #3. One would have read those when answering the previous questions. At Violet Township all areas are addressed when looking at any issue to make sure that the correct one is provide for what's best for the fire department and the community.

Answering question #4 – *Can additional methods be used to reduce response times in the northwest section of Violet Township?* This question can be addressed by many of the previous reviews listed. If you were to look deeper into some the articles, review the NFPA standards closer, there would be answers to this question. At Violet Fire, we feel that there could be other methods to accomplish our goals in reducing response times. These literature review articles will answers many questions that would be raised when asked to prove our research.

In review, the literature review has raised many questions and has provided many answers to the research questions. This will help provide Violet Township Fire Department with a starting place to begin further plans for developing additional resources in the northwest section of the township.

PROCEDURES

This research began in 2005 after discussing possible topics with Assistant Chief John Eisel of the Violet Township Fire Department, and with OFE Instructor/Dept. Chief Don Cooper. Once this author finalized his topic, “Methods for Determining the Need for a Third Fire Station in the Northwest Section of Violet Township” others were consulted and interviewed such as Mark McCann of Washington Township Fire Department and Dave Ward of the Lancaster Fire Department. Bill Lynn of the Washington Township Fire Department was consulted after the author’s first draft was graded and was assigned as the authors mentor.

Research began by looking into the need of this study for Violet Township by reviewing past run reports. Many discussions at Violet Township lead this author to look into the background of the problem of response times in the northwest section of Violet Township.

This author researched past statistics from the Violet Township, the Violet Township Fire Department, City of Pickerington, and the Pickerington School District to help determine the validity of this problem. The author researched statistics that looked at the population in the township and city, run volumes and response times, and enrollments in the school district.

The literature review focused on the topics of adding an additional station in a specific area, decreasing response times, pre-emption devices and any other methods to decrease response times. This author obtained information from the Fairfield County Library, periodicals, Internet sites, and many journals and books.

Looking at the topics that needed addressed the author developed a survey and what data needed to be collect on the research questions presented previously on this research topic. Discussions with past OFE students about the information to be retrieved, it was decided that a survey will be the best and most effective method. Numerous questions were developed but due

to the over abundance and the broad nature of questions, several question were eliminated. The author wanted to keep the question bank to between 10 and 15. Once the bank was established, the survey was developed.

The descriptive survey will be electronically distributed to members of the Ohio Fire Chiefs Association. The Ohio Fire Chiefs Association was selected because; one of the past presidents is the Violet Township Fire Departments, Chief Kenn Taylor. So, our administration assistant had all the e-mail addresses to distribute out. Distribution will be by electronic mail, sent from the authors fire department e-mail account. The e-mail will contain an introduction, and instructions on how to complete the survey.

A link to the survey was contained in the e-mail, so that respondents can complete the survey in a minimal amount of time. The survey contained drop down menus to assist in continuity of data, and ease of completion. For informative purposes, the survey also will contained areas that respondents can provide comments to the questions listed previously in this research proposal. The survey requested demographic information from the respondents, and a list of questions to collect data and comments.

A total of 631 surveys were distributed electronically to the members of the Ohio Fire Chiefs Association. Of the 631 sent out 42 surveys or 6% received “delivery failure notice”, 589 surveys or 93% were delivered successfully. Of the 589 surveys successfully delivered 75 or 13% responses were received. Survey results were collected into a database program and the results were exported into a spreadsheet for tabulation and analysis of the data collected.

Definition of Terms

VTFD. Violet Township Fire Department

VT. Violet Township

NFPA. National Fire Protection Association

EMS. Emergency Medical Services

AHA. American Heart Association

ESO. Emergency Service Organization

ISO. Insurance Service Organization

Station. Fire Station

HAZ MAT. Hazardous Materials

ALS. Advance Life support

ITS. Intelligent Transportation System

OFE. Ohio Fire Executive

Pre-emption. Sensors installed at traffic lights to turn them green in the direction that the apparatus is traveling.

Quality of Service. How the VTFD is committed to effectively and efficiently meet the needs of our diverse and growing community by providing the highest quality service that our customers demand. We are dedicated to surviving, being nice and being your “*Friends for Life*” in the way we respond to emergency calls and live our daily lives.

Limitations of the Study

The distribution of the survey was intended for a target audience of fire service officers, utilizing the Ohio Fire Chief Associations e-mail list. A limitation of the survey is that 631 surveys were sent to fire departments through out the state of Ohio. Out of the 631 only 589 were delivered and 75 or 13% submitted responses to the survey questions. The assumption also was that every question was understood and that accurate data were given in the survey process. Also an assumption was that the target audience understood the meaning of pre-emption when filling out the survey.

RESULTS

The results of the research survey respond to the four research questions. These responses lead the author in the correct direction to help create a master plan for the Violet Township Fire Department. Out of the 75 surveys returned a Chief answered 39 of the surveys, Assistant Chief, answered 20 surveys, Battalion Chief, answered 7 surveys, Captain, answered 5 surveys, Lieutenant, answered 4 surveys. Some form of an officer answered all the questions. The research survey answers were tallied and the author believes that the results can be used in future research on the response time topic.

The original research questions were addressed through the survey results. Survey question number one and two were general and related to all four of the research questions. The questions were presented to get an idea of whether or not response time in there area were a concern and that they were taking some sort of measures to rectify the concern (See Figure 7 and 8).

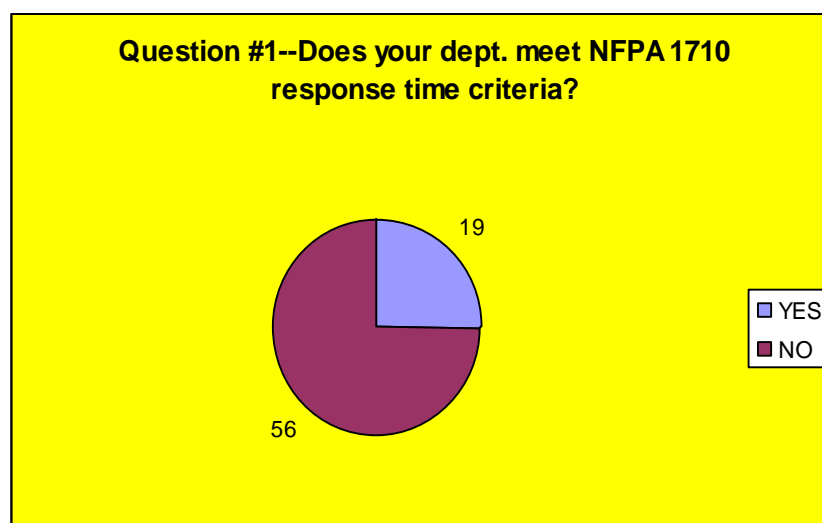


Figure 7.

Answers to the survey question #1 showed that 56 of the responses didn't meet the 1710 response time criteria and 19 responses did.

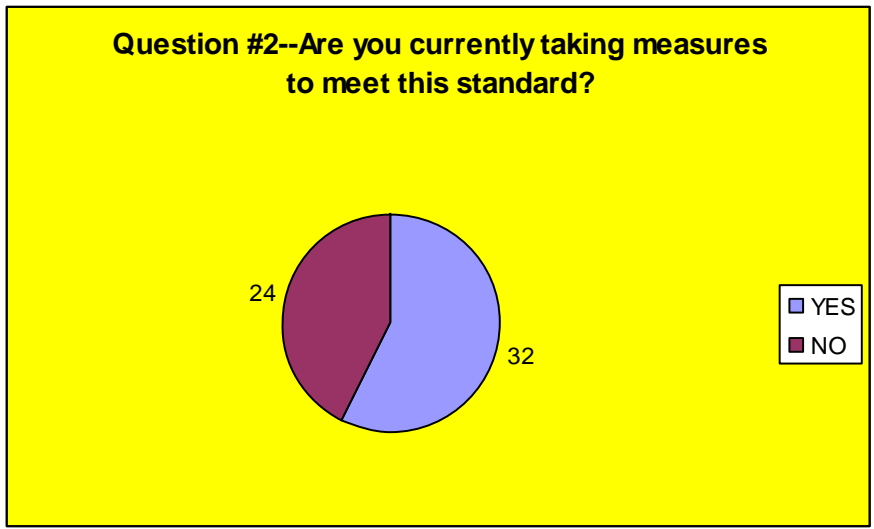


Figure 8.

Out of the 56 that were not meeting the response time criteria 32 were taking measures to fix the problem and 24 were doing nothing.

Question three illustrated methods of correcting the overall problem (See Figure 9)

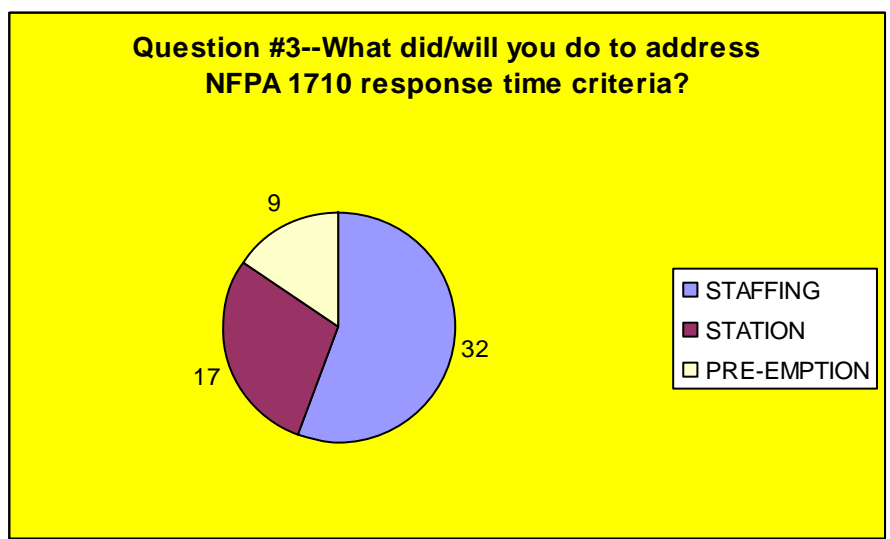


Figure 9.

In order, staffing, stations, and pre-emption were the ways to attempt meeting 1710 criteria.

Three illustrations were suggested, which related to the research questions and survey, and another section was included for additional ideas to the question.

Original research question #1 asked, “What will happen to response times if a station is added to the northwest section Violet Township?” The descriptive research survey question 6 and 10 addressed these questions. Out of the 75 responses 11 added a station and could document a reduction where 64 didn’t add a station (See Figure 10).

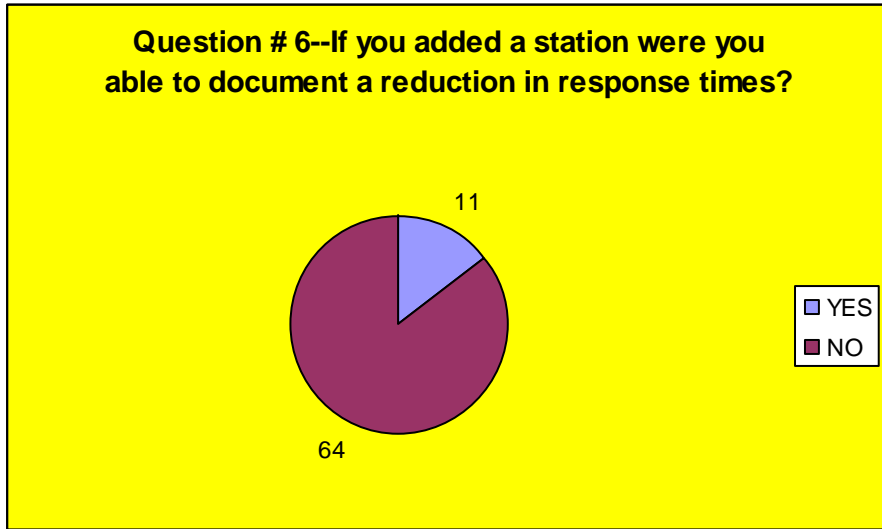


Figure 11.

There was only 11 times that a reduction in response times could be documented out of the 75 responses.

Out of the 11 there were only 7 that could document the reduction of response (See Figure 12).

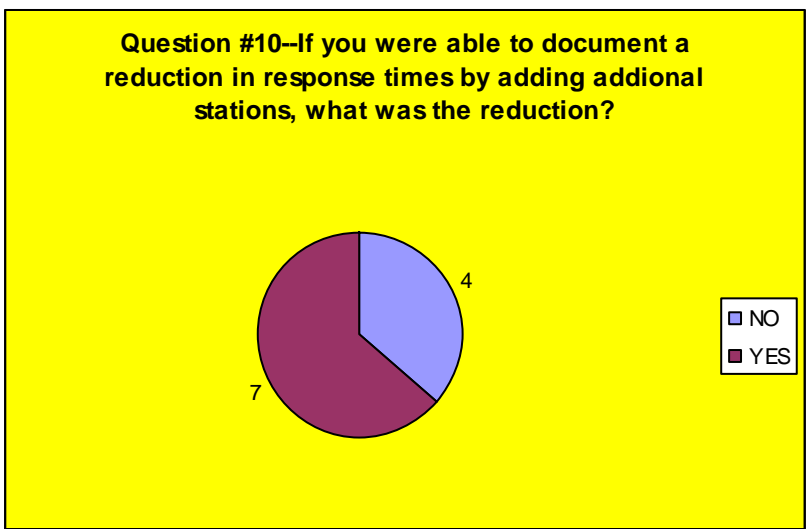


Figure 12.

Only 7 out of 11 surveys claimed that they could document reduction in response times by adding an additional station.

With the 7 departments left 4 of the 7 could document a reduction of greater than 2.5 minutes and the remaining 3 were less than 1.5 minutes

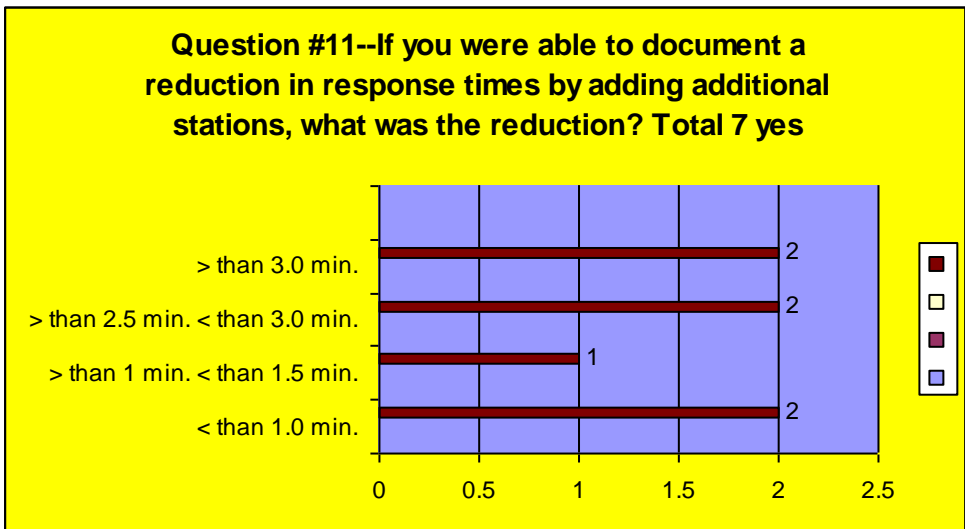
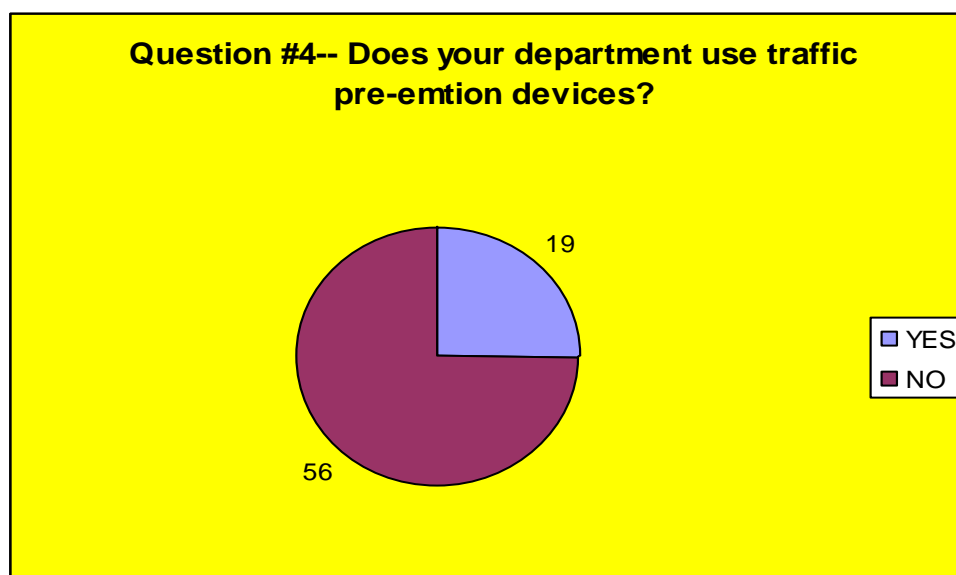


Figure 13.

Documentation of response times ranged from greater than one minute (2) to greater than three minutes (2).

Original research question #2 asked, “How can traffic pre-emption devices add to response time reduction?” The descriptive research survey questions #4, #5, and #8 addressed this question. With the 75 responses 19 departments use a pre-emption device and 56 departments do not (See Figure 14).

**Figure 14.**

There were 19 out of 75 that used pre-emption devices that returned surveys.

Out of the 19 only 4 could document and have a reduction in response time (See Figure 15),

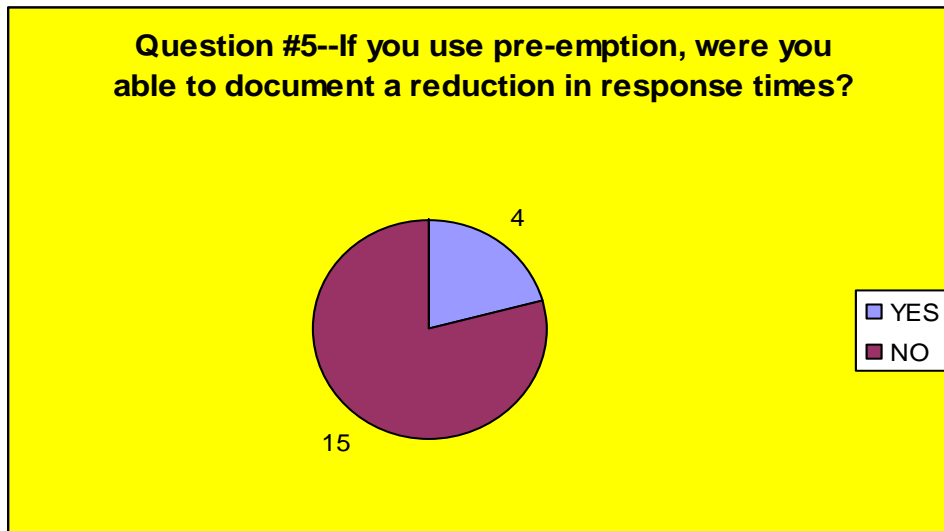


Figure 15.

Only 4 out of the 19 were able to document any type of reduction in response times.

Three of them had a reduction of between 1 and 1.5 minutes and the remainder was less than 1 minute (See Figure 16).

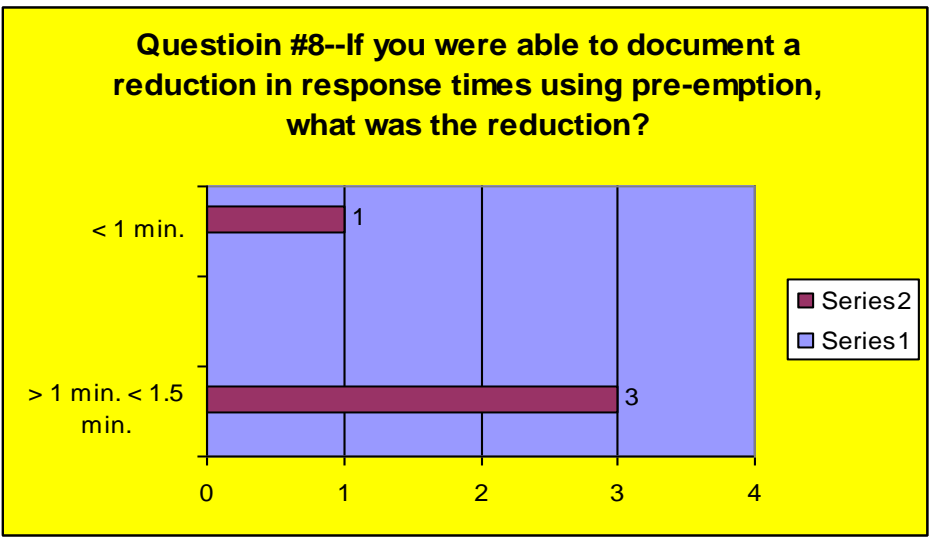


Figure 16.

Reduction of between 1 minute and 1.5 minutes were documented when using pre-emption devices

Original research question #3, “How could staffing at an additional station affect the fire department?” The descriptive survey questions number seven and nine address the impact of staffing. The survey indicated that 17 out of 75 times, a reduction could be accounted for (See Figure 17).

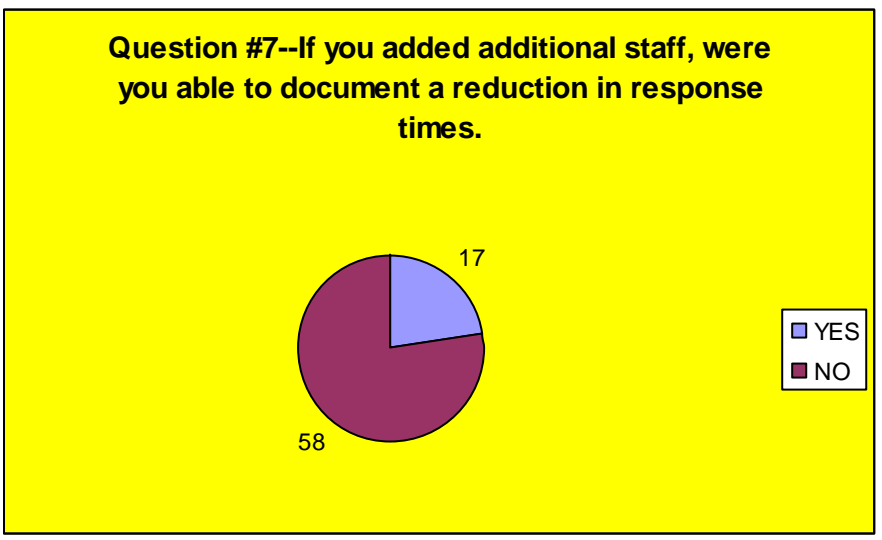
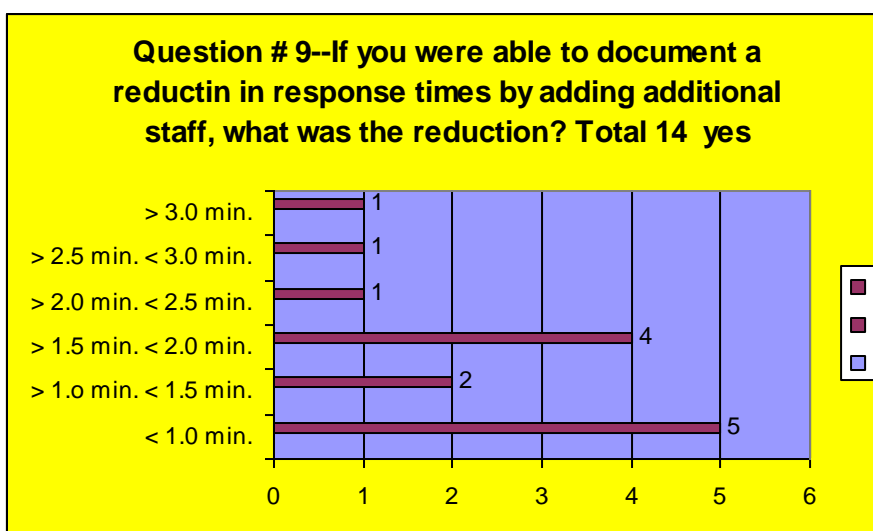


Figure 17.

There was only 17 times that one could document a reduction in response time by adding staff.

Out of the 17, 14 showed a reduction of less that 2 minutes and 3 were greater than 2 minutes (See Figure 18).

**Figure 18.**

Reduction times ranged from less than 1 minute to greater than 3 minutes by the addition of staff.

Original research question #4, “What additional methods can be used to reduce response times in the northwest section?” Question number 11 brings all the other survey questions together with the 4 research questions. Out of the 75 responses 56 came back with no overall reduction in documented response times (See Figure 19).

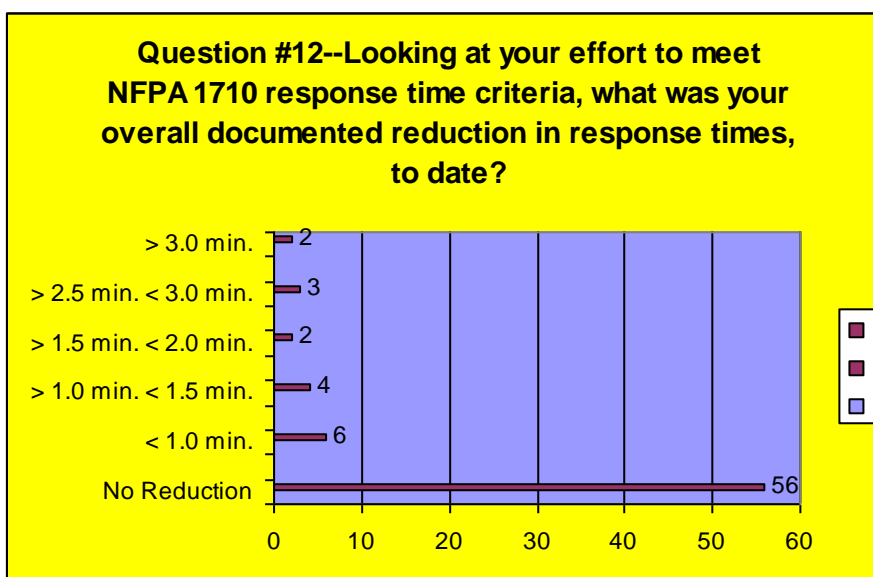


Figure 19.

The remaining reductions range from less that 1minute to greater than 3 minutes.

The results of the demographic questions in the survey were to see how other departments compared to VTFD. Out of the 75 responses only 10 departments had much higher number of career firefighters, more stations and responses than VTFD. Violet Township Fire Department then compared well with the rest of the departments. The demographics section was just to make sure that career firefighters responded to the survey and that an officer of the department answered the survey questions. The size of the departments and number of staff didn't come into the author's conclusions because the problems of the station location and response times still exist no matter how large or small the departments are.

Table 1

Summary of the results the author received for the survey sent out to the Ohio Fire Chiefs.

1. Does your department meet NFPA 1710 response time criteria?

19 yes 56 no

2. If the answer to the questions above was no, are you currently taking measures to meet this standard?

32 yes 24 no

3. What did/will you do to address NFPA 1710 response time criteria?

9 - Install traffic pre-emption devices

17 – Additional stations

32 – Staffing

4. Does your department currently use traffic pre-emption devices?

19 yes 56 no

5. If you do use traffic pre-emption devices, were you able to document a reduction in responses once they were in service?

4 yes 15 no

6. If you added a station (or stations), were you able to document a reduction in response times once the station or stations were in service?

11 yes 64 no

7. If you added additional staff, were you able to document a reduction in response times once the additional staff was in place?

17 yes 58 no

8. If you were able to document a reduction in response times using pre-emption devices, what was the reduction?

1 - less than 1 minute

3 – greater that 1 minute but less than 1.5 minutes

Table 1

Summary of the results the author received for the survey sent out to the Ohio Fire Chiefs

9. If you were able to document a reduction in response time by adding additional staff, what was the reduction in response times?

- 1 – greater than three minutes
- 1 – greater than 2.5 minutes but less than 3.0 minutes
- 1 – greater than 2.0 minutes but less than 2.5 minutes
- 4 – greater than 1.5 minutes but less than 2.0 minutes
- 2 – greater than 1.0 minute but less than 1.5 minutes
- 5 – less than 1.0 minute

10. If documented, what was the reduction in response times by adding additional an station or stations?

- 2 – greater than 3.0 minutes
- 2 – greater than 2.5 minutes but less than 3.0 minutes
- 1 – greater than 1.0 minute but less than 1.5 minutes
- 2 – less than 1 minute

11. Looking at your efforts to meet NFPA 1710's criteria for response times, what was your overall documented reduction in response times (to date)?

- 2 – greater than 3.0 minutes
- 3 – greater than 2.5 minutes but less than 3.0 minutes
- 2 – greater than 1.5 minutes but less than 2.0 minutes
- 4 – greater than 1.0 minute but less than 1.5 minutes
- 6 – less than 1.0 minute
- 56 – no reduction recorded

12. List of rank or title.

- 39 – Chief
 - 20 – Assistant Chief
 - 7 – Battalion Chief
 - 5 - Captain
 - 4 - Lieutenant
-

DISCUSSION

The rapid increase in population and growth, both in residential and commercial, current response times to the northwest section guides this research to improve the quality of service in the VTFD area. Different aspects were addressed in the research and provide valuable information to make a complete determination of the need for an additional station.

The literature review identifies numerous methods of determining the best deployment for fire and ems protection from any given area in a particular fire district. Station location, response times, staffing, pre-emption devices are some of the areas that are discussed. Accombs (2002), Cole and Russell (2001), Coleman (2003), identify the importance of selecting proper building sites. They also identify benefits both planning and economic development of a station. Ludwig (2005), Baltic (2001) discusses the response aspect of the proper location of a station. Pre-emption devices are discussed by National Intelligent Transportation System (ITS) Implementation Research Center on the discussion of growing traffic issues.

The NFPA standards, although not a law but a benchmark, will help local jurisdictions decide which directions they will pursue to meet their objectives. NFPA 1710 (2004) and 1201 (2004) identify and describe the areas that the author researched toward determining the need of an additional station.

The literature review indicated that there are tremendous advantages for defining station location, response times and pre-emption devices. These advantages are beneficial if they are implemented by the fire department to develop a high level of customer service programs in the community.

The survey results on the other hand showed some advantages but they were not as overwhelming as the literature review. The results were able to address the author's original

research questions but were not able to back up their findings with any solid results or documentation. Those that could come up with documentation on the questions showed that additional station and staffing were the methods of choice when attempting to fix the response time problem. Out of the 19 departments that used the pre-emption devices only 4 could document any reduction in the response times. This could have come from the lack of understanding of the question for a concrete answer or that only four departments could document any reduction. So this area needs further studies to make any kind of determination to whether or not they are worth the expense to use pre-emption devices.

Station location and staffing will have an organizational and financial impact associated with resolving this problem. Will manpower have to be hired, at an expense or will existing manpower be moved from the present stations to cover an new station? Will a new piece of apparatus need to be bought for this venture? Then will a new structure have to erected to accommodate these needs? These implications of station location and staffing could be a tremendous asset to the department in helping improve response times to the northwest section as per the literature review and survey. But, further research needs to be accomplished to decide the answers to the additional questions, as listed above. The author of this paper or future authors could elaborate on these venues to further state their case.

RECOMMENDATIONS

The stated problem is the VTFD is faced with the challenges of response times that come with the rapid population and growth affecting the northwest section of Violet Township. The purpose of the study was to research and determine methods to reduce response time to the northwest section of Violet Township. The literature review helped support the addition of a new station and staffing of the station more so than the survey did. Survey results didn't overwhelmingly identify a station and staffing as a solid fix but the departments that were able to document the results showed definite improvements.

The results of the survey indicate that departments have benefited in the areas of adding additional stations and staffing. The recommendation is that the VTFD begin planning for an additional station and staff to utilize the literature as well as the survey to use as guidance for implementation.

It is recommended that within the coming months that VTFD look at utilizing this research to develop a master plan before the growth rapidly overcomes the department. The department needs to take this research and build from the results on the literature review and survey to improve the response times to the northwest section of VT.

As the statement of the problem indicates the VTFD is facing the challenge of response times in the northwest section of Violet Township. Based upon this research, the author believes that Violet Township Fire Department needs to further investigate the placing of an additional station and staff to the northwest section to benefit the safety, efficiency, effectiveness, and continuous service to that area. Future authors could benefit on this research paper and use it as a stepping stone on further investigating the response issue to a specific area of their running district.

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APPENDIX 1 – COVER LETTER AND SURVEY



Greeting,

My name is Doug Barr and I am a Lieutenant with the Violet Township Fire Department, currently enrolled in the Ohio Fire Executive program Class V. I am conducting a survey to compile statistics for my OFE paper, and for our department information. Specifically, my research pertains to the benefits of additional staffing, stations and pre-emption when it comes to NFPA 1710 response time criteria within our district.

If you could please take a short moment to complete the survey, located at:

<http://www.violet.oh.us/ltbarrvtfld.asp>

This survey will run from today through May 1, 2006. Your input would be a great value to our department and the fire service in general.

Once compiled, if requested, we can forward an analysis of the results to you in order to assist you regarding response times criteria set forth by NFPA 1710. Please contact me if you desire a compilation of the results.

Thank you in advance for our attention to this matter, and your time.

Respectfully,

Lt. Doug Barr
Violet Township Fire Department
Doug.Barr@violet.oh.us
614-837-4123 (1 unit)

If you have received this Email in error, please disregard and accept our my apologies.

This survey investigates if determining if a new fire station could improve response times in fire departments. I will thank everyone in advance for his or her valuable time

*Lieutenant Douglas Barr
Violet Township Fire Department*

This survey investigates the ways departments are meeting or attempting to meet NFPA 1710 standards regarding response times. I wish to thank you in advance for your valuable time.



Lt. Doug Barr
Violet Township Fire Department

Department Name:

Number of fire stations in your district: (If none, please enter a zero)

Number of Career Firefighters: (If none, please enter a zero)

Number of Part Time Firefighters: (If none, please enter a zero)

Number of Volunteer Firefighters: (If none, please enter a zero)

1. Does your department meet NFPA 1710 response time criteria?

Yes No

2. If the answer to the question above was No, are you currently taking measures to meet this standard?

Yes No

3. What did/will you do to address NFPA 1710 response time Criteria?

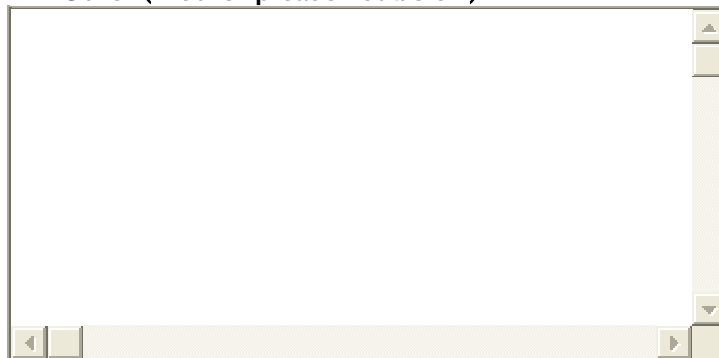
(Select as many as apply, and please answer even if you are meeting response time criteria)

Installed Traffic Preemption Devices

Additional Stations

Staffing

Other (if other please list below)



4. Does your department currently use traffic preemption devices?

Yes No

5. If you do use traffic preemption devices, were you able to document a reduction in response times once they were in service?

Yes No

6. If you added a station (or stations), were you able to document a reduction in response times once the station or stations were in service?

Yes No

7. If you added additional staff, were you able to document a reduction in response times once the additional staff was in place?

Yes No

8. If you were able to document a reduction in response times using preemption devices, what was the reduction?

No Reduction able to be determined

9. If you were able to document a reduction in response time by adding additional staff, what was the reduction in response time?

No reduction in response time documented

10. If documented, what was the reduction in response times by adding additional an additional station or stations?

No reduction in response time documented

11. Looking at your efforts to meet NFPA 1710's criteria for response times, what was your overall documented reduction in response times (to date)?

No reduction in response time documented

For accuracy purposes, please list your name:

First

Name

Last

Name

Please list your rank or title:

Fire Chief

May I contact you if I have any questions?

Yes No

Please list your daytime contact phone number:

(please include area code, no hyphens necessary)

Enter your Email address in the space below, if applicable: