

**City of Vandalia Division of Fire**  
**Study of the Feasibility of the Current Paid-on-Call Staffing Model**

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A research project submitted to the Ohio Fire Executive Program

12 January, 2005

## 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 corrected the errors as suggested by the program.

Signed: \_\_\_\_\_

Printed Name: \_\_\_\_\_

## ABSTRACT

This applied research study will examine the City of Vandalia Division of Fire's ability to continue to provide the current level of fire/EMS services using the existing paid-on call (POC) staffing model.

The problem that this applied research project will explore whether or not service demands have exceeded the capability of the division's POC staff. This study could result in organizational, philosophical, and fiscal changes for the division.

The purpose of this applied research study is to examine the City of Vandalia Division of Fire's staffing and determine if changes need to be implemented to improve service delivery to the citizens of the City of Vandalia.

A descriptive method of research was employed to answer the following questions:

1. What are some of the motivating factors that attract paid-on call fire/EMS workers to the division of fire?
2. Using today's available information, will the city grow beyond the capabilities of a predominately paid-on-call fire and EMS service?
3. Based on service demand trends over the past five years what trends in requests for service exist to indicate a workload that may be above capabilities of the current system?
4. Using today's available information, what recommendations can be made to assist in retention and recruiting of paid-on call personnel?

The procedures used included a literature search, a review of historical response data from the last five years 2000-2004 and an employee survey tool that provided data an analysis of the fire division's current paid-on call staffing model.

The significant limitations of this study are; (1) that the recommendations are long term and they will have a significant budgetary impact. However, they are necessary to reduce long term spending, to secure current paid-on call staffing and improve overall the emergency services provided to the City of Vandalia.

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## INTRODUCTION

### **Statement of the Problem**

The problem that this applied research project will explore whether or not service demands have exceeded the capability of the division's POC staff. This study could result in organizational, philosophical, and fiscal changes for the division.

### **Purpose of Study**

The purpose of this applied research study is to examine the City of Vandalia Division of Fire's staffing and determine if changes need to be implemented to improve service delivery.

### **Research Questions**

A descriptive method of research was employed to answer the following questions:

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4. Using today's available information, what recommendations can be made to assist in retention and recruiting of paid-on call personnel?

## **BACKGROUND AND SIGNIFICANCE**

It is the objective of fire suppression to “get to the fire as quickly as possible and to extinguish it with minimum loss to persons and property from the fire and from firefighting activities” (ICMA 1988, p120). While many individuals and agencies share the delivery of fire protection services, “the executive fire officer is responsible for the direction of resource allocation to provide a level of service to protect the community” (Cato, 1990, p2.)

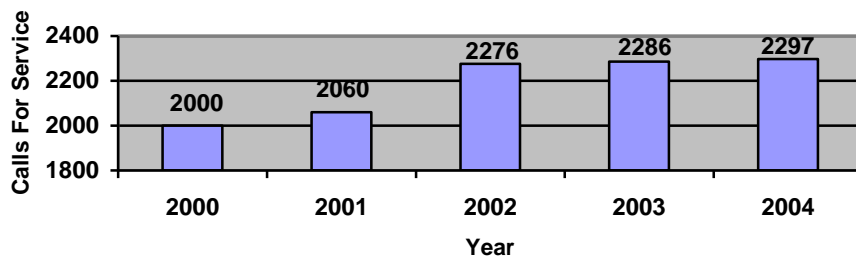
The City of Vandalia Division of Fire is a combination fire department providing fire protection, rescue response, hazardous materials response, and emergency medical services to 14,600 people across 12.5 square miles. The City of Vandalia is a suburban community located seven miles north of Dayton, Ohio, along the northern border of Montgomery County. Established as a joint fire district (with Butler Township) in 1946 the Butler Township Fire Department provided fire protection to the City of Vandalia and Butler Township until early 1976. In 1976 the City of Vandalia split off and created independent organizations know as the City of Vandalia Division of Fire.

The City of Vandalia Division of Fire operates from two fires stations, utilizing three class “A” fire engines, one rescue engine, one 110’ aerial ladder, one 2000 gallon tanker, and four advanced life support medic units. The City of Vandalia Division of Fire has authorized force strength of seventy-five people; eight career and sixty-five POC personnel, currently the division employs forty-seven POC personnel with varying certifications and nine career fire/EMS personnel. All career firefighters are required to be a state certified Level 2 firefighter, a state certified paramedic, and a state certified fire safety inspector. The fire division provides, as a minimum, an in-house paramedic from Sunday through Friday from 1000pm (Sunday night) until 1000pm (Friday night). Additional career and paid-on call staffing is assigned Monday thru

Friday from 1000am to 600pm. Paid-on call are permitted respond from home twenty-four hours a day to cover emergency responses that exceed the in-house capability or that occur during times that in-house manning is not available (including forty-eight hours from Friday to Sunday). A basic life support first responders is assigned during all times that a career paramedic is not, this first responder responds from his/her home directly to the scene of an emergency and provide advance/basic life support or acts as an incident commander.

The Division of Fire responded to 2,297 requests for service in 2004. Figure #1 shows a five year trend from 2000 to 2004 of subtle but a steadily increasing call for service volume within the city.

**Figure 1 Vandalia Fire Division 5 Year Trend 2000-2004 Total Calls For Service**



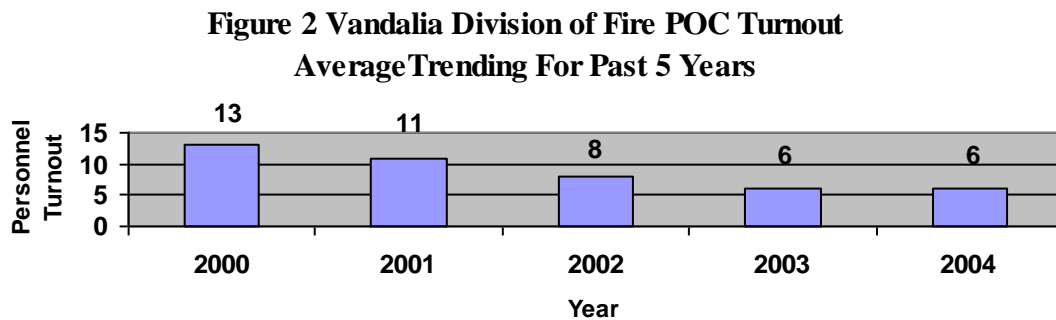
The division of fire is funded through city generated tax revenues and the division does bill insurance companies and non-residents for EMS service, however, revenue generated by EMS billing is applied directly to the city's general fund, and in 2004 EMS billing generated almost \$500,000.00. The division of fire enjoys an Insurance Service Organization Protection Rating of 4.

Working from a \$1,500,000.00 budget the division of fire commits \$1,250,000.00 to personnel, \$305,000.00 of that budget is earmarked for paid-on call, the remaining \$945,000.00 are costs associated with the career personnel (salaries, benefits, overtime, etc.) The city has



struggled over the last three years as revenues have declined and the division has been forced to stray from its ten year capital improvement plan (CIP). Operationally the division has “tightened its belt” and worked hard to exist within the established budget. Although CIP funds have declined the division is fortunate in that city council and the city manager have been diligent in the allowance of CIP funds to address firefighter safety projects. The division has been able to maintain critical pieces of firefighter safety equipment; such as radios, thermal imaging cameras, firefighter/EMT protective clothing, and heart monitors.

As the division continues to evolve and progress it is struggling with response issues that can be directly tied to the growth of our community, a changing philosophy in the POC workforce, and an increase in call volume. The division has seen an influx of younger community members seeking paid-on call involvement. Figure #2 shows that in the past three years there is a documented declining trend in POC turnout.



The division is committed to enhancing service deliver, while maintaining sound fiscal practices. The division is committed to measuring its performance against its mission statement and to adjusting to meet the needs of the community through a sound mission and vision.

The research problem presented herein will examine the division's POC workforce, trends in increase calls for service, and the potential for growth within the organization. This study could result in organizational, philosophical, and financial changes for the division.

## LITERATURE REVIEW

### Research Question 1.

When analyzing the factors that affect the current POC employees you have to first look at what motivates a volunteer or POC employee as a human. Once you understand the factors that affect them as a person you can more accurately assess the factors that affect them as an employee.

Maslow's Hierarchy of Needs (Harper & Row 1970) theorizes that human beings are motivated by unsatisfied needs, and that certain lower needs need to be satisfied before higher needs can be satisfied. Maslow felt that people are basically trustworthy, self-protecting, and self-governing. Humans tend toward growth and love. According to Maslow, there are general types of needs. Figure #3 shows Maslow's Hierarchy of Needs.

**Figure 3 Maslow's Hierarchy of Needs**



A study that was conducted in the Bloomington Minnesota Fire Department, they surveyed 115 volunteer fire/EMS personnel, the study captured responses from approximately 82% of the total volunteer workforce. The data showed that there were three main reasons that they volunteered. They were; (1) contribution to the community, (2) benefits, and (3) excitement. On the opposite side of the spectrum the survey showed that there were four main reasons why they stopped volunteering; (1) the time demand was too high, (2) loss of interest, (3) personal conflict, and (4) to some degree length of service played a role in a volunteer's decision to leave.

Ted Poszywak, Horry County Fire/Rescue (January 2004) researched issues facing volunteer recruitment and retention in the Horry County Fire/Rescue Department. The Horry County Fire/Rescue is located in South Carolina, and spans approximately 1200 square miles and has a resident population of 196,000 people. The Fire/Rescue Department provides protection to this community using a combination of approximately 250 career (full-time) and 200 volunteer fire and emergency medical personnel. This study looked at what the trends in volunteer firefighter membership, recruiting and retention. The study employed a convenience sample survey that was distributed to 30 volunteers in the organization. Some of the top findings were; (1) a better mentoring program that originates with the department's cadet/explorer program, (2) implementation of benefits, more specifically a retirement and health care plan, (3) implementation of a tuition reimbursement or assistance program, (4) improved leadership, more specifically leader training, improved discipline, communication, and succession planning, (5) improved team building, ownership and pride in the organization.

In an Executive Fire Officer paper by Ulysses S. Seal, of the Bloomington, Minnesota Fire Department, (volunteer motivations were researched. A survey of 115 of the volunteers

employed by the Bloomington Fire Department (sample accounts for approximately 80% of the total staff), Mr. Seal looked at the factors that influence a member to join, the factors that cause a member to quit, and how age contributes to that comparison. Mr. Seal cited service to the community, benefits, and excitement (responding to the wide variety of emergencies, and actually responding to emergencies) as several of the most important factors. Mr. Seal's research showed that length of service and age of an employee also figured into the primary factors affecting retention.

In "Volunteer Management" by Steve McCurley and Rick Lynch (April 2000) spoke to the motivational and behavioral aspects of volunteers. The pair speaks to "unmotivated behavior" as an attitude caused by frustration. Being able to identify volunteer's motivational factors makes customizing their job or their experience as a volunteer more effective. According to the practices outlined in this book the key to retaining volunteers is to ensure that volunteers get their particular complex of motivational needs met through their volunteer experience. The pair feels that a volunteer program that is positive and has enthusiastic climate encourages volunteers to return and aides the volunteer in the development of self-esteem. This type of program empowers volunteers and connects them to an organization at an ownership level.

Jeff Stern wrote an article in Firehouse Magazine (March 1997) entitled "Getting Along In Combination Fire Departments". Mr. Stern wrote that a vital factor in combination departments is the need for equality. This encompasses all aspects of the service; from training to operations, to management. Mr. Stern stated that all members performing the same job should meet the same level of training. A separate standard for firefighters drives a wedge between career and volunteer personnel. Career and volunteer members should have equal access to training.

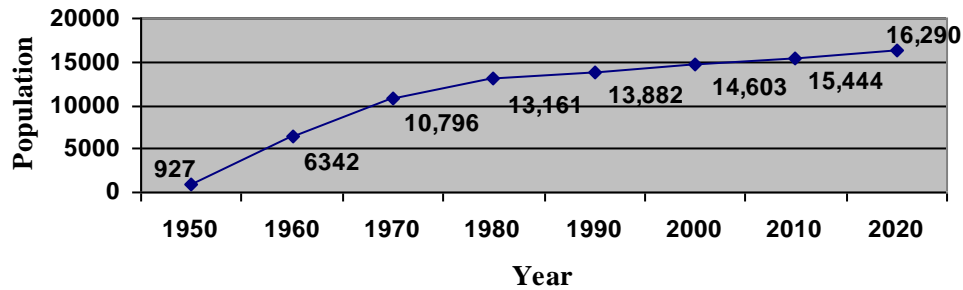
“A major hurdle of retention is the demands placed upon our POC employees, initial and ongoing fire/EMS training account for half of an employees overall activity with the Vandalia Fire Division” (VFD 2004). “Initially firefighters come to us with at least thirty-six hours of state certified training. However, initial fire training certifications can vary from thirty-six (36) hours to two-hundred and forty (240) hours of initial training.” Emergency medical personnel have four level at which they can choose to be certified at; (1) First Responder, which is a forty (40) hour course, valid for three years, and only renewable if you participate in at least fifteen (15) hours of continuing education in that three year period; (2) Emergency Medical Technician Basic and/or Intermediate which is a one hundred and twenty (120) hour course initially, valid for three years, and only renewable if you participate in at least forty-eight (48) hours of continuing education in that three year period; (3) Paramedic which is anywhere from a fifteen hundred (1500) hour to two year degree program, valid for three years, and requires a valid Advanced Cardiac Life Support certification (which is an additional 16-40 hour class based on where it is a refresher or first time course) and at a minimum of forty-eight (48) hours of continuing education in that three year period. These hours are the basic certification requirements, they do not include specialty training (i.e. fire safety inspectors, fire instructor, EMS instructors, EMS special topic instructors, hazmat, technical rescue, etc.).

The City of Vandalia Division of Fire requires that every firefighter/EMS employee attend at a minimum seventy-two (72) hours of department training per year. Employees can apply some of the training provided to there certification renewals.

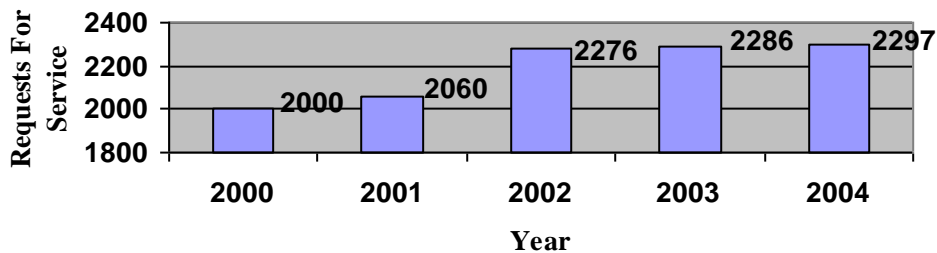
**Research Question 2 & 3.**

Burns, Berth & Harris, Inc. (2000) used a mathematical tool to develop a Historic Population Growth chart for the City of Vandalia during their 2000 Comprehensive Plan Update. According to the City of Vandalia’s census the cities current population is 14,600 (2004). In four years (2000-2004) the city has seen a 21% increase in its population, Figure 4 shows the projected growth in population through 2020.

**Figure 4 City of Vandalia Historic Population Growth Chart**



**Figure 5 Vandalia Fire Division 5 Year Trend 2000-2004 Total Calls For Service**



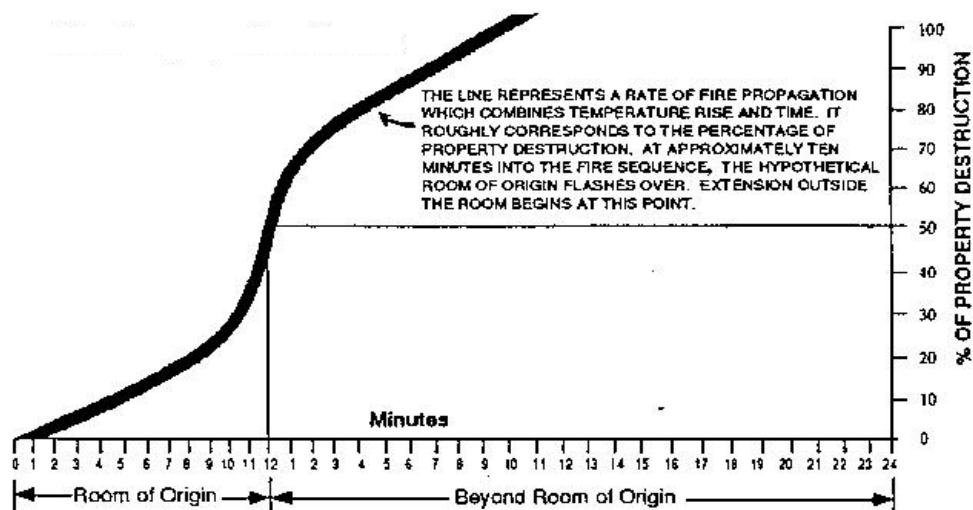
The International City Management Association said this about response times; “A prudent response pattern needs quick response times as well as a sufficient number of firefighters for the immediate attack.” (ICMA 2<sup>nd</sup> Edition 1988). The ICMA separates fire suppression operations into three basic functions; (1) rescue; (2) work involving ladders, forcible entry, and ventilation; and (3) the application of water via attack hose lines.

“Various controlled and statistically based experiments by some cities and universities reveal that if about sixteen trained firefighters are not operating at the scene of a working fire within the critical time period, then dollar loss and injuries are significantly increased, as are the square feet of fire spread” (ICMA 2<sup>nd</sup> Edition 1988).

“ The Dallas Fire Department studied (IAFF 1993) the effectiveness of three, four, and five person firefighting crews in an attempt to justified apparatus manning in 1984. The Dallas study made the assumption “that a five person firefighting crew is 100% effective in performing the critical tasks required for an interior attack”. Their research provided that as manning was decreased to four and three person companies their efficiency was reduced. Figure 6 represents Dallas’s interpretation of the impact that reduced staffing has on the effectiveness of fireground operations involving a single-family residential structure.



**Figure 6 Impact of Crew Size of First Alarm Assignment on Fire Attack is a Residential Structure**



The Dallas study was confirmed for small fire departments by the Westerville, Ohio Fire Department (IAFF 1993). The data produced by the Dallas study showed that; “when rescue occurred between 12 and 15 ½ minutes, the survival rate was 46 ½%. The rate dropped to 5 ½% when rescue occurred between 15 and 17 ½ minutes”. Simply put; “a 2 to 3 minute variance in the speed with which rescue operations could be completed can increase fire victim survivability eight fold”.

In 1966 the National Fire Protection Association issued NFPA Standard 197, *Training Standard on Initial Fire Attack*. As outlined in the IAFF’s, *Safe Firefighter Staffing* study (IAFF 1993) “The standard set forth the evolutions required for an initial interior fire attack. The standard required sufficient number of firefighters and equipment to deploy two attack hose lines and one back-up line. While the NFPA 197 does not specify the number of firefighters necessary to deliver this required flow, it does specify the tasks that must be performed with in a

given time period”. The standard does say; “The desirable number of men normally required to respond with the apparatus to give this level of performance with properly manned hose streams and equipment would be approximately fifteen plus the chief”.

The City of Vandalia Division of Fire General Operating Guideline (GOG) outlines the minimum staffing requirements for fire and emergency medical apparatus responding to specific calls for service. The guidelines states; “Minimum and maximum manning levels are established to afford company’s maximum operating efficiency and safety as well as to ensure that as much apparatus as possible is manned in order to protect the community” (VFD 2002). Figure 7 shows the minimum and maximum number of trained personnel permitted to respond.

**Figure 7 City of Vandalia Division of Fire Minimum and Maximum Manning Standard**

<b>Apparatus</b>	<b>Minimum</b>	<b>Maximum</b>
Engine	3	6
Ladder	3	6
Tanker	1	2
Air/Light Unit	1	2
Medic	2 (EMT's)	4
Grass Truck	2	2

Structural fires within the City of Vandalia’s jurisdiction have a minimum of three engines, one ladder, one air/support vehicle, one medic, and one command officer assigned to them. In accordance with the current General Operating Guideline (GOG) (see Figure 7) that would mean you should have at least a minimum of sixteen people assigned on the first alarm.

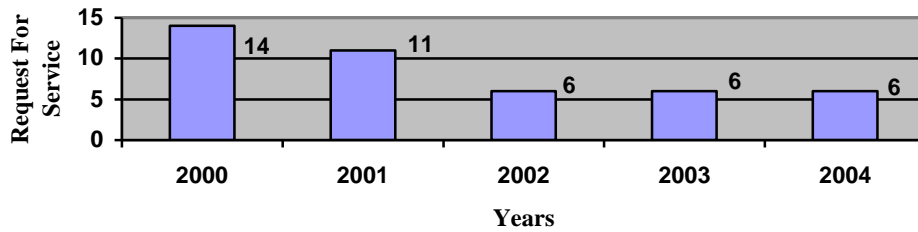
The fire division uses a box card alarm system (Appendix B) to assign apparatus, as fire or emergencies grow beyond the capabilities of an initial alarm assignment an incident commander can request additional resources through the dispatch center. The dispatch center would reference the cards when sending additional resources. The minimum and maximum manning shown in Figure 7 has been adopted regionally as a standard.

In a United States Fire Administration conducted a cooperative with the National Fire Protection Association, the study provided statistical data on the average number of volunteer firefighters who respond to a mid-day house fire. The data represents only cities that have 50,000 or fewer people. Figure 8 shows the average number of volunteer firefighters that turnout for a mid-day fire. The highlighted section represents the population range that the City of Vandalia falls into. Figure 9 represents a five year trend of POC turnout in the City of Vandalia Division of Fire that is consistent with the USFA statistics.

**Figure 8 Average Number of Volunteer Firefighters Responding to a Mid-Day House Fire**

<b>Population</b>	<b>1-2</b>	<b>3-4</b>	<b>5-9</b>	<b>10-14</b>	<b>15-19</b>	<b>20 +</b>	<b>Total</b>
25,000 - 49,999	2.6%	9.4%	23.0%	28.3%	15.2%	21.5%	100.0%
10,000 - 24,999	3.7%	11.7%	32.8%	26.5%	13.0%	12.4%	100.0%
5,000 - 9,999	2.9%	11.4%	39.5%	26.1%	12.7%	7.3%	100.0%
2,500 - 4,999	3.1%	12.2%	45.9%	25.6%	9.7%	3.6%	100.0%
Under 2,500	3.0%	18.3%	48.0%	22.1%	6.1%	2.5%	100.0%

**Figure 9 Average Number of Paid-On Call Firefighters Responding to Mid-Day Fire Response (Five Year Trending)**



The National Fire Protection Association is credited with supplying research data on several aspects of the fire service including turnout and response times. According to the National Fire Protection Association Fire Protection Handbook states; “Nothing is more important than the element of time when an emergency is reported. Fire growth can expand at a rate many times its volume per minute. Time is the critical factor for the rescue of occupants and application of extinguishing agent. The time segment between fire ignition and the start of fire suppression is critical and has a direct relationship to fire loss” (Barr, R.C. & Caputo A.P., 1997, p 10-250).

It is important to recognize that in a typical fire, flashover occurs within eight to ten minutes. Therefore, one could conclude that a fire department should arrive as close to four minutes as possible. Figure 10 is the National Fire Protection Associations Fire Growth Curve and Response Sequence. This sequence shows clearly that turnout time and travel time are the most directly manageable and subsequently the most critical time sequences for a fire protection agency.

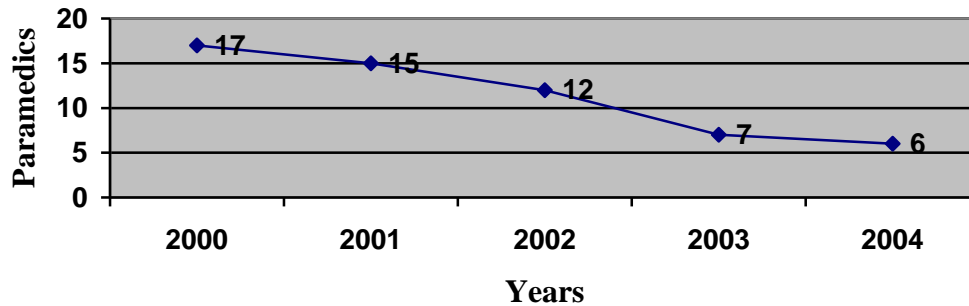
**FIGURE 10 Impact of Crew Size of First Alarm Assignment on Fire Attack in a Residential Structure**

Crew Size:	1st Engine Company		2nd Engine Company		Truck/Ladder Company		
	Charge Initial Interior Line and Advance	Locate & Rescue Victim	Charge Interior Support Line & Advance	Charge Exterior Line & Advance	Roof Ventilation	Search and Rescue	Check Exposures for Fire Extension
5 Fire Fighters	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
4 Fire Fighters	84.7%	96.1%	77.9%	72.9%	79.0%	90.3%	80.2%
3 Fire Fighters	71.3%	82.8%	0.0%	62.3%	0.0%	79.6%	0.0%

The benchmarks for emergency medical care are equally as important as are those for fire suppression. The National Fire Protection Association’s Fire Protection Handbook states; “The delivery of emergency medical services is also time critical. Survival rates for some types of medical emergencies are dependent upon the rapid intervention by trained emergency medical personnel. In most cases, the sooner that trained fire or emergency medical personnel arrive, the greater the chance for survival and the conservation of property” (Barr, R.C. & Caputo A.P., 1997, p 10-250).

The mission of the City of Vandalia Division of fire is; “to provide superior fire, emergency medical, educational and prevention services to the citizens we serve. By consistently delivering these services in a courteous, safe and professional manner we hope to enhance the quality of life for the citizens of Vandalia.” Delivering superior care, as defined by the division of fire, is being able to deliver ALS, or paramedic services and predominately POC paramedic coverage. However, the trending data shows a significant drop in the number of available POC paramedics over the last five years. Figure 11 shows the number of available POC paramedics over the last five years.

**Figure 11 Vandalia Fire Department Available POC  
Paramedics Five Year Trend**



NFPA Standard 1710 states; “The fundamental concept of fire risk is associated with modern society. Public fire service organizations are expected to reduce the risk within their areas of jurisdiction by taking measures to prevent the outbreak of fires, to limit the extent and severity of fires, to provide for the removal or rescue of endangered persons, to control and extinguish fire that occur within the jurisdiction, and to perform other emergency response operations and delivery of emergency medical services” (NFPA 2001).

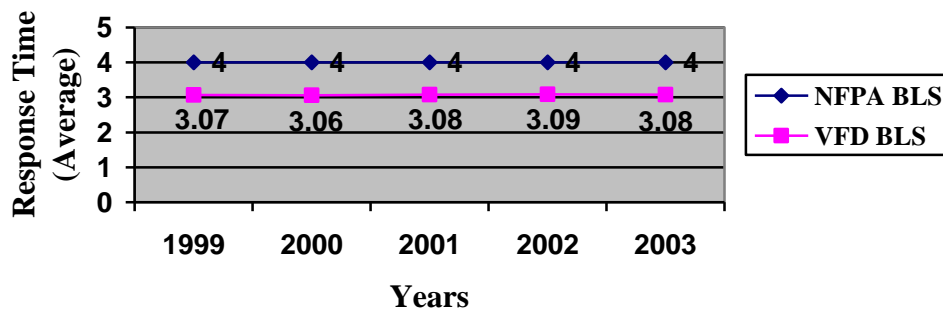
“This standard includes minimum requirements that are intended to provide effective, efficient, and safe protective services that operate on a sound basis to prevent fire and reduce risk to lives and property, to deal with incidents that occur, and to prepare for anticipated incidents. It sets minimum standards considered necessary for the provision of public fire protection by career fire departments” The National Fire Protection Association (NFPA, 2001) recommends that a fire departments response time be broke down in the following manner; (1) one minute (60 seconds) for turnout time, (2) four minutes (240 seconds) or less for the arrival of the first arriving engine company at a fire suppression incident or eight minutes (480 seconds) or less for

the deployment of a full first alarm assignment at a fire suppression incident, (3) Four minutes (240 seconds) or less for the arrival of a unit with first responder or higher level capacity at an emergency medical response, (4) eight minutes (480 seconds) or less for the arrival of an advanced life support unit at an emergency medical incident, where this service is provided by the fire department” (NFPA 2001).

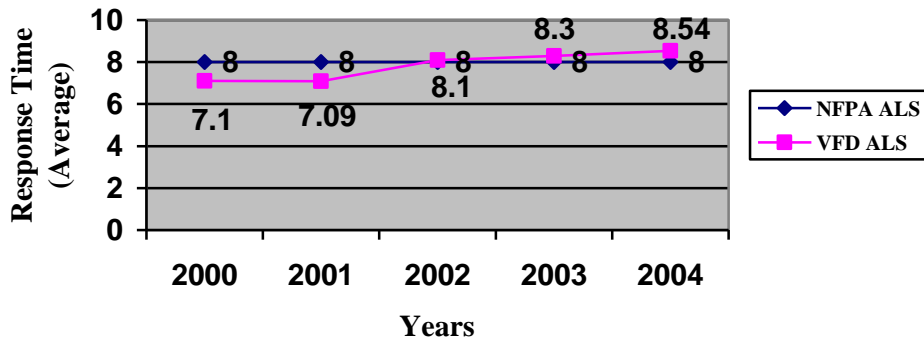
The American Heart Association has adopted similar benchmarks as a standard of care; the AHA calls for basic life support measures (CPR and rapid defibrillation) to begin within four minutes, to be followed by advanced life support measures within eight minutes (American Heart Association 2000).

Figures 12- compare the City of Vandalia Fire Division response times in each category (BLS, ALS, and fire first responders) to the national averages established by the NFPA.

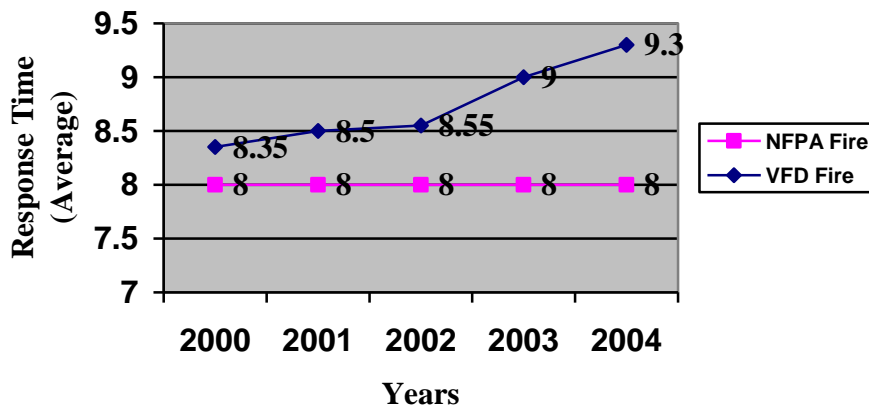
**Figure 12 - Response Time Comparison to NFPA 1710 Standard**



**Figure 13 ALS Response Time Comparison to NFPA 1710 Standard**



**Figure 14- Fire Response Time Comparison to NFPA 1710 Standard**



In an article by Patrick McLaughlin (January 2004) entitled “Growing Pains”, Mr. McLaughlin presents data collected from a survey of 500 fire chiefs, fire marshals, and fire commissioners from communities of all sizes across the United States. The phone survey conducted by Opinion Research Corporation International of Princeton New Jersey, examined the current conditions (2004) as well as what was likely to occur over the next three years. The margin of error in the survey was published as 4%. The survey provided a significant data that

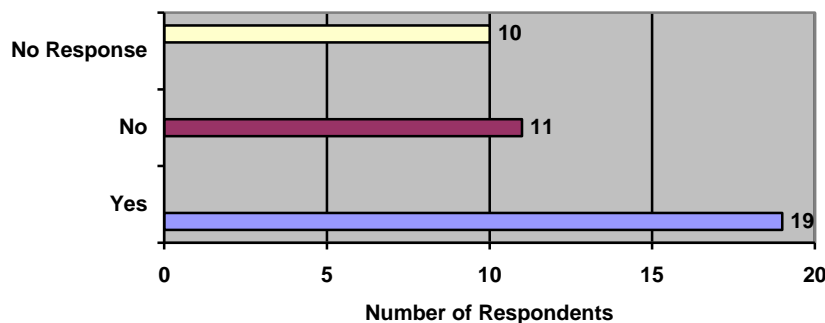


would indicated of the departments surveyed a large percentage (73%) feel that residential and commercial growth within there communities has significantly impacted there ability to deliver services. 84% of those surveyed felt that growth has surpassed their department’s available resources (fire, EMS, fire prevention, fire safety inspections, and water supply capabilities). Those departments surveyed that felt they were progressing appropriately and responding appropriately to the increased demands of there communities did indicate that they have made a substantial financial investment to keep up. Looking three years out 81% of those surveyed felt that growth was likely to place a significant strain on resources. Of those surveyed 91% stated that the cost associated with the continued delivery of services at or above the current level would place a significant financial strain on their communities.

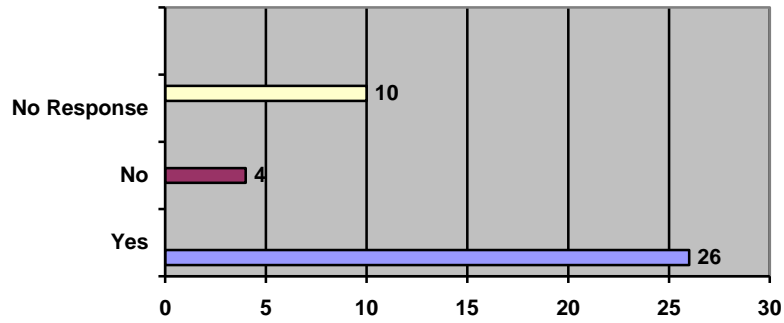
**Research Question 4.**

As a part of this research study a survey was developed and distributed to forty paid-on call employees of the fire division through the interoffice mail network. Thirty of the surveys were returned. The intent of this survey was to obtain direct data from the workforce as a means of developing responses to research questions #4; “Using today’s available information, what recommendations can be made to assist in retention and recruiting of paid-on call personnel?” The results of the survey are summarized below:

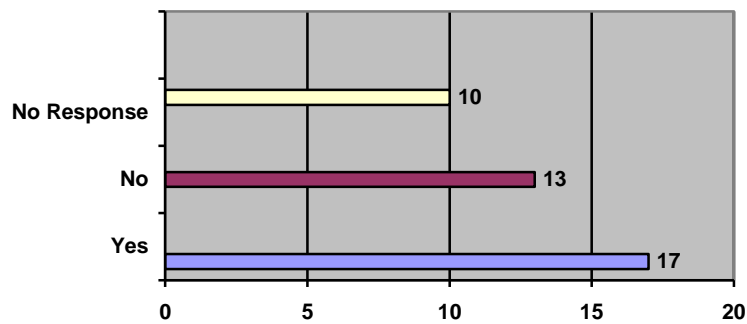
1.) Have training requirements effected your fire department commitment?



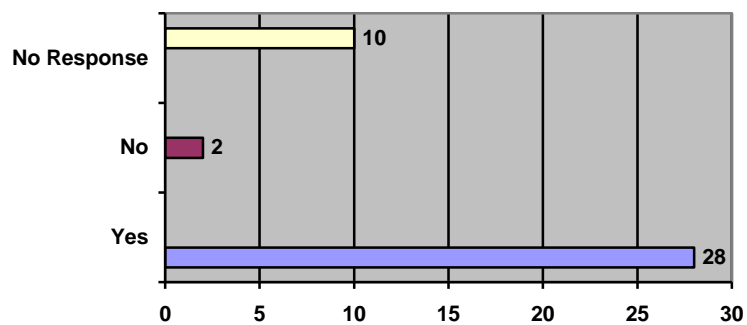
2.) Do you feel money is a significant factor in your time commitment to the department?



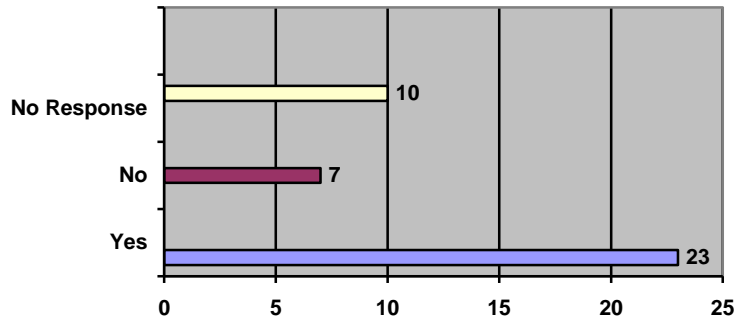
3.) Has the implementation of stronger scheduling guidelines effected the time that you are able to provide the department?



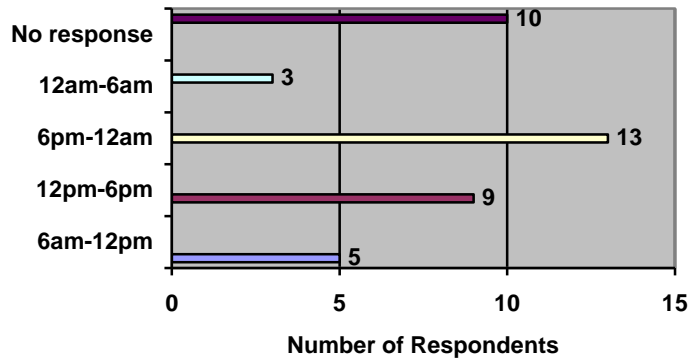
4.) Do “fringe” benefits (pool passes, recreation passes, paid training, etc) play a significant role in your commitment to the department?



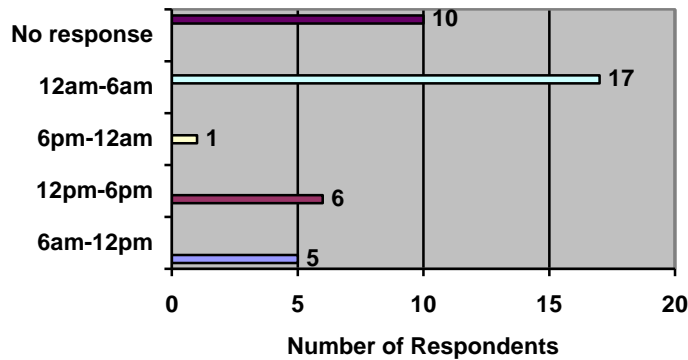
5.) Do you feel that there is a need to move beyond paid-on call staffing?



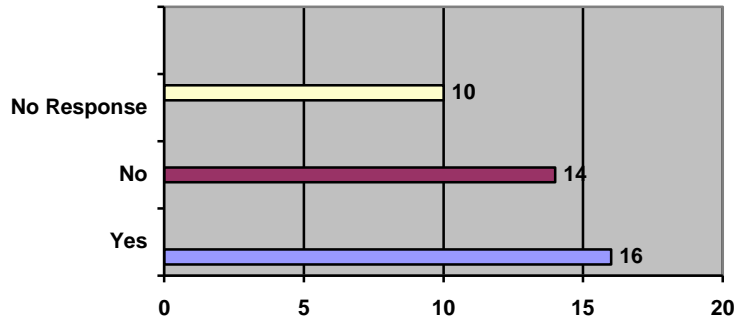
6.) What time frames do you find yourself most available to respond?



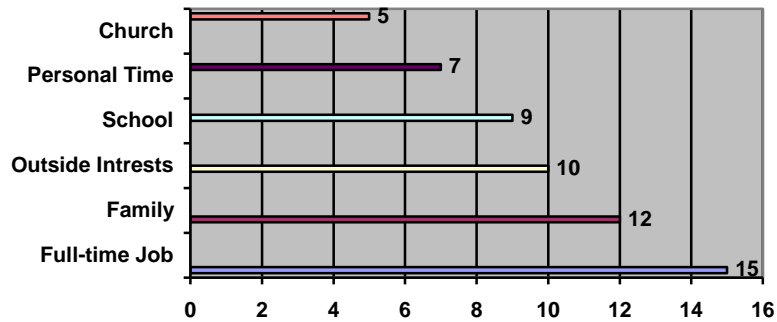
7.) What time frames would you most like to not have to respond in?



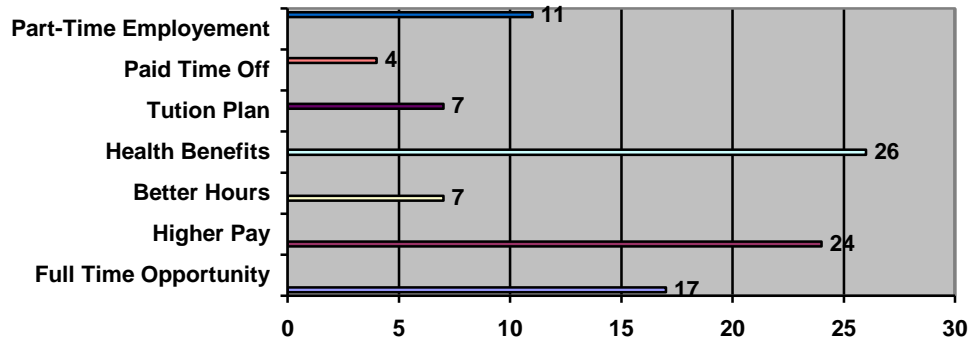
8.) Do you feel that the run volume and non-emergency response work load has increased beyond the capability of the paid-on call employee?



9.) Name two of the factors that take you away from providing service as a paid-on call person?



10.) If given the opportunity to recommend two things that would be incentives to you to increase you commitment to the division what would they be (limit your answers to one word response)?



## PROCEDURES

### Definition of Terms

The following definitions are important terms used in this Applied Research Project.

AHA American Heart Association

ALS advanced life support

BLS basic life support

EMT emergency medical technician

GOG General Operating Guideline

IAFF International Association of Firefighters

ICMA International City Management Association

NFPA National Fire Protection Association

POC paid-on-call personnel

USFA United States Fire Administration

VFD Vandalia Fire Department

This study was conducted using historical and evaluative research techniques. The study began by conducting a literature search for documents relating to volunteer recruiting, volunteer retention, and volunteer staffing issues. Many of the recommendations were drawn from those articles. Since several of the research questions were specifically focused on the utilization of the POC personnel a large portion of this study was statistical data specifically tied to the fire department it was determined that a survey sample of the department would be the best vehicle for obtaining answers to several of the research questions. Forty questionnaires were sent out to paid-on call members using the division internal mailbox system. Thirty-five questionnaires were returned. A sample questionnaire has been included in the Appendix section of the study

for review.

Additional data was gathered using the department's incident reporting database. Statistics relevant to the departments response times and response totals were pulled from that database and displayed in the study in various tables and charts. Additionally, data was taken from several NFPA standards.

## **RESULTS**

### **Answers to Research Questions**

#### **Research Question 1.**

If you were able to equate modern thought with the needs identified by Maslow you would find a direct correlation between the present day factors and the factors identified by Maslow so many years ago. If you were to look at Maslow's needs and try to tie the specific needs of a volunteer into those categories you would find a very close comparison. Several of the highlighted studies in this research project have identified the needs of a volunteer or POC employee, including the survey tool utilized in this Applied Research Project. Some examples would be the need for stimulation and activity, the Bloomington Minnesota Fire Department's 1991 study identified excitement as one of the top three reasons a BFD employee volunteers. In the Horry County Fire/Rescue (January 2004) study the need for benefits, improve succession planning, team building, and communication were all identified as the top factors in volunteer retention. These factors are closely related to the need for security, belongingness, and self-esteem. Finally, if you look at the "Volunteer Management" article by McCurley and Lynch (April 2000), you will see that ideally you want to instill ownership and pride in your volunteers and that if you are able to fulfill these needs your end product is a volunteer that feels fulfilled, and holds his position precious and it becomes a calling or vocation for he/she (self-actualization).

### **Research Question 2 & 3.**

The trending information provided in this study shows a slow growth process setting-up. Both population and call volume seem to be at present growing slowly. It seems feasible to believe that if action is required that it should occur now rather than later.

Data regarding response or turnout times was plentiful. Several reputable organizations have conducted studies that show fire grows at an alarm rate when allowed to go unhampered beyond ten minutes. Studies also indicated that rescue of trapped fire victims is most successful when it occurs within 12-15½ minutes. Survivability is 5½% when rescue goes beyond 15 minutes.

The NFPA and AHA believe that life saving care must arrive within four to eight minutes to be effective. The data presented shows a BLS response time of 3.08 minutes, fifty-two seconds under the NFPA standard. ALS times (shown in Figure 13) have climbed above the national standard; the fire division's data shows a 1:34 minute increase in response times over the last three years. Fire response times have also climbed about the NPFA recommended standard by a 1:35 minutes.

Once fire/EMS crews arrive there must be enough manpower available on scene to achieve the standard there to be efficient and to perform the three basic functions: (1) rescue; (2) work involving ladders, forcible entry, and ventilation; and (3) the application of water via attack hose lines. The NFPA 197 recommends that it would take approximately fifteen personnel to deliver a attack with 100% efficiency. The City of Vandalia requires that, on a first alarm assignment, they will have a minimum of sixteen personnel available to achieve functional efficiency.

With a minimum standard established one could say that a sixteen person response is not



currently achievable in the fire division. Despite the GOG requirement the fire division is tracking a three year trend that would indicate an average turnout of six POC members for a mid-day fire.

#### **Research Question 4.**

When asked if training requirements effect his/her fire department commitment 63% indicated that it did. Only 33% responded that it did not. Training accounts for about half of a POC employees activity per month (9 hours/month).

“Do you feel money is a significant factor in you time commitment to the department?” 87% of those polled indicated money was a significant factor in their commitment to the department. Comments provided varied from those that felt they received a fair compensation, others felt that we were competing with other fire departments for their time. Only 13% responded no to this question.

Employees were asked: “Have the implementation of stronger scheduling guidelines affected the time that you are to provide the department”? Approximately 57% indicated that schedule changes had affected their time commitment. Employees cited availability of “prime” time hours as the reason they were not working. Some stated that they were working significant hours through the daytime hours, Monday through Friday and the felt that they shouldn’t have to commit extra time at night or on the weekends to running additional shifts. Only 43% indicated that scheduling policy does not play a role in their commitment

Employees were asked; “Do fringe benefits (pool passes, recreation passes, paid training, etc.) play a role in your commitment to the department”? A very high percentage of employees surveyed (93%) felt that “fringe” benefits were a significant factor in their commitment to the department. Several commented that this was the main reason they were employed. Several

took the opportunity to suggest how the benefits could be improved by adding recreation center memberships, health care, life insurance, and an expanded tuition program. One employee suggested that the POC personnel be reclassified as permanent part-time employees, this would open them up to additional benefits (like the recreation center pass and expanded tuition reimbursement). One of the downsides to re-classifying the employee is that, when converted they would be making significantly less money than they currently do, in addition they would be subject to Fair Labor Standards and would be required to limit their hours.

Employees were asked if they thought the division had moved beyond part-time staffing. 77% indicated that they felt the division had grown beyond the capabilities of POC. The largest percentage of those responding stated that they felt the division could do a better job of providing a “skeleton” crew of “paid” employees around the clock. Some felt that the expectation of POC personnel was set too high by the “new administration”. The remaining 23% that responded “no” to question six, stated that they felt the POC personnel were efficient, one employee stated that they felt as if the career personnel complemented the service provided by the POC personnel and that elimination of POC personnel was a “very bad idea”.

Employees were asked; “What time frames do you find yourself most available to respond”? 43% responded that 6pm to 12am was the best time for them, 30% responded that 12pm to 6pm was the best time for them, 17% responded that the 12pm-6pm time frame was the best for them, 16% indicated that the 6am-12pm was the best time frame for them to respond, and 10% indicated that they are most available during the 12am-6am time frame. There were few extra comments made in this section one respondent stated that his selection was based on time worked Monday through Friday, and that weekend response varies for him.

The consensus is that the 12am-6am time frame is the least popular (57%) among the POC personnel. Most comments related to the need for sleep to attend their day jobs, school or to attend to their families. Several stated that placing a career person on “mid-nights” has greatly benefited them and that they feel more obligated to show-up in the other time frames.

When asked; “Do you feel that the run volume and non-emergency response work load has increased beyond the capability of the POC employee?” 53% indicated that they felt run volume had grown above the POC personnel’s capabilities. One of those that responded affirmatively to this question stated that he felt request for service during peak times (5am-9am and “overnight and weekends”) had significantly grown, and that response times and turnouts during these times were poor both from POC and off-duty career personnel. 47% indicated that runs had not exceeded the capabilities of the POC. Several employees stated that they felt runs were considerably down, and that when multiple calls come in they are answered in a timely manner.

Employees put their full-time job first on their personal priority list, when asked what things take you away from fire department service employees responded by saying that their full-time job was first, followed closely by family and family events. The remaining list of priorities were; (3) outside interest (i.e. golf, softball, civic group participation, etc.); (4) school; (5) personal time/vacation; and (6) church/church events.

Employees were asked to recommend two things that they would consider incentives that would hopefully motivate them to step-up their commitment to the division (responses were solicited as a one word answer). A large percentage (87%) felt that offering benefits (insurance health and/or life) would be a positive step in motivating employees. The second largest response (80%) was increased pay. The remaining responses varied; (3) 57% wanted “full-time”

employment, several wrote in the comments section that they would like to have some type of assurance that future full-time hires would come from within the organization, one mentioned that they would like to see a “lateral entry” procedure; (4) 37% indicated that they felt part-time employment would secure their commitment to the division, comments requested hourly pay scales instead of the table that the division currently uses; (5 & 6) 7% responded that better tuition and hours would firm up their commitment to the division, citing the need for college education and more flexible hours as rationale; and (7) 4% requested paid-time off as a benefit that they thought would motivate them to put more time into the department.

## **DISCUSSION**

In whole, the current system of POC employees is not a sufficient service delivery system for the City of Vandalia. Specifically, the availability of POC personnel and the ability to retain a sufficient number of POC employees both in present day and looking into the future will be a significant challenge. The division has spent the better part of its existence developing a POC at the cost of its career personnel. Career moral and overtime costs are mounting while requests for service and response time are growing. The division has the opportunity to take offensive steps now by configuring manning in a manner that it will provide rapid, effective, and economical service to the community.

POC personnel, that are currently still classified as “a will employee’s” (volunteers) with the city are given the opportunity to grow themselves within the organization. They have access to their hierarchy of needs on a daily basis. However, with a growing demand for rapid service and the constantly changing mission of the fire division the POC personnel are struggling to keep up. That struggle is now becoming evident in turnout and response time data.

Research literature revealed several studies highlighting manpower and response standards. The focus needs to be placed on the delivery of life saving services both fire and EMS, the NFPA and AHA require that ALS care be on scene within eight minutes and that a properly staffed fire engine arrive within eight minutes. The division should view these recommend standards as benchmarks and a manpower strategy should follow.

Currently the division is using its career personnel in several of the key time frames; however, staff is spread thin. Reorganizing the career staff into a platoon system, placing one career firefighter/paramedic on a twenty-four hour schedule would easily achieve the NFPA’s 1710 standard (both BLS & ALS). However, it would not address the POC turnout and response

time issues. Although the IAFF and Dallas studies show that a five person initial company is more efficient, that option is presently financially or logistically infeasible for the fire division.

The political considerations are wide spanning; as the community looks to expand and grow, safety services are always a primary concern. Increased population and sprawl create logistical challenges for the fire divisions; currently the division is delivering “around the clock” service from one fire station, located at the northern most point of the city. As residential subdivisions begin to develop in the areas on the fringe of the corporation limits, response times will grow. When you combine longer travel distances, decreased turn-out, and the present problem of increased response times, you have to consider the outcomes. It is important that the city administration and council look at the provided standards as benchmarks for performance and not an attempt to “wash-out” the POC personnel. Using national standards as benchmarks for performance will ensure that the best possible service is being delivered and provide the frame work for better strategic planning.

A significant three year decrease in revenues has plagued the city; economically the current system of POC fire/EMS professional is ideal. Poor POC turnout saves money. However, if the trend continues the fire division will be forced to reduce crew size eliminate in-house POC staffing, reduce training opportunities, and re-work POC schedules to meet the demand. Overtime costs are climbing as career employees are forced in to cover POC shortfalls. A strategic plan that provides for a better utilization of POC staffing and funding is going to be a significant challenge for the fire division.

The survey data is telling; the POC personnel want more for their commitment. The department has evolved and the social climate within the organization is changing as a part of that evolution. The desire to serve ones community still exists; it’s just not a motivating factor.

The need for increased salaries, better benefits, added “perks”, and better education have become the factors that motivate POC members. They understand that the demand for service is increasing they just don’t have the time to “step-it-up” anymore. A large percentage of the POC members demand a schedule that is more voluntary.

## **RECOMMENDATIONS**

The current POC manpower strategy to meet a growing demand for service is beginning to fail. Current data reveals that the division is falling short of meeting nationally accepted standards. POC turnout is decreasing and response times are increasing. The following recommendations are long term and they will have a significant budgetary impact. Additional funding will be necessary in order to implement them.

1. The division should move to provide a staffed 24 hour a day resource. Growing response times could be significantly impacted by placing response resources in-house around the clock. This would significantly reduce an initial responding resources turn-out time and get skilled personnel to the scene of an emergency well within the accepted standard.

2. The division should consider supplementing the current combination system (career/POC) with hourly part-paid personnel. This would allow the division to better utilize personnel monies. Reducing POC staff through attrition and curtailing their response to the time frames that they are available. Combining part-time personnel with career personnel to respond as an initial resource to fire/EMS calls for service would significantly impact the division's ability to meet the nationally accepted standards, while meeting the financial challenges.

3. The division should research the cost and feasibility of offering, free or at a discounted rate) additional benefits to its POC personnel (health care plan, life insurance)

4. The division should consider expanding the college tuition re-imburement program to their include POC, the division could use an application and selection process to select members that would be eligible for this program.



5. The division should consider entertaining a POC advisory group to develop buy-in. Organization and implementation of this group's recommendations to develop and improve the program may develop a sense of ownership in the program and the division.

6. The division should consider improving and expanding the current peer mentor program, to include company officers. The intent of this program would be to offer some succession planning for POC members and offer them the opportunity to move-up in the organization.

7. The division should conducting further research into how training alternatives can be used to provide necessary continuing education while minimizing the time commitment required by the employee.

8. The division should continuing analyzing their request for service by geographic location. Using this data the division should determine where their response resources can best be utilized. If a single resource is put into place from the main fire station what will the response time implications be for citizens requiring service in other areas, more remote from the central fire station?

9. The division should look to its neighbors to expand their automatic mutual aide agreements. Developing a healthy partnership with the surrounding departments may provide a cheaper alternative than adding additional personnel, fire/EMS equipment or fire stations.

10. The division should lobby council and the city manager to consider changing their current legislation concerning the collection and application of the EMS fees. Currently the division only bills non-residents. Opening the billing up to everyone would make it possible to collect some money that is normally written off by the division. The division should also use a collection tool to obtain money currently being paid directly to their patients.

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**APPENDIX A**

**Employee Sample Survey Form**

**APPENDIX 1 – Sample Survey Form**

1.) Have training requirements effected your fire department commitment?

Yes Why? \_\_\_\_\_

No Why? \_\_\_\_\_

2.) Do you feel money is a significant factor in your time commitment to the department?

Yes Comments: \_\_\_\_\_

No Comments: \_\_\_\_\_

3.) Has the implementation of stronger scheduling guidelines effected the time that you are able to provide the department?

Yes Comments: \_\_\_\_\_

No Comments: \_\_\_\_\_

4.) Do “fringe benefits” (pool passes, recreation passes, paid training, etc.) play a significant role in your commitment to the department?

Yes Comments: \_\_\_\_\_

No Comments: \_\_\_\_\_

- 5.) Do you feel that there is a need to move beyond paid-on call staffing?
- Yes
  - No

If you answered yes to #5, what type of manning would you suggest?

- Expand POC stand-by
  - Part-time personnel only
  - Part-time and career
  - Career
- 6.) What time frames do you find yourself most available to respond?
- 6am-12pm
  - 12pm-6pm
  - 6pm-12am
  - 12am-6am
- 7.) What time frames would you most like to not have to respond in?
- 6am-12pm
  - 12pm-6pm
  - 6pm-12am
  - 12am-6am
- 8.) Do you feel that the run volume and non-emergency response work load has increased beyond the capability of the paid-on call employee?
- Yes
  - No
- 9.) Name two of the factors that take you away from providing service as a paid-on-call person?
- 1.) \_\_\_\_\_
- 2.) \_\_\_\_\_

10.) If given the opportunity to recommend two things that would be incentives to you to increase your commitment to the department what would they be (limit your answers to one word responses)?

1.) \_\_\_\_\_

2.) \_\_\_\_\_

\*Please make any additional comments on the back

**APPENDIX B**

**City of Vandalia Division of Fire Box Alarm Card**



## APPENDIX B- City of Vandalia Division of Fire Alarm Card

Alarm Type	Engine	Ladder	Medic	Tanker	Air	Special
<b>Structure Fire</b>	2,3,4, BTFD	8	M1		7	Assignment Utilities
<i>Working Fire</i>	Huber		M2			
<i>2nd Alarm</i>	Harrison, Bethel	Tipp City	M3/Mutual Aid		Clayton	
<i>3rd Alarm</i>	Englewood/Clayton	Huber	Mutual Aid			
<b>Automatic Fire Alarm</b>	3	8				
<b>Vehicle Fire</b>	3					
<b>Vehicle Fire</b>						
I-75 South of Northwoods	4		M1 (Standby)	6		Butler Fire
Airport Access Road	4		M1 (Standby)	6		Butler Fire
I-75 North of Northwoods	4		M1 (Standby)	6		Tipp Fire
<b>Grass/Brush Fire</b>	4					Grass
<b>Trash/Dumpster Fire</b>	3					
<b>Investigation</b>	3					
<b>EMS Call</b>			M1			
EMS Call Interstate Highway	4		M1			
<b>Land Rescue</b>	4	8	M1			GATOR @
<b>Swimming Pool Rescue</b>	4		M1			
<b>Water Rescue</b>	4	8	M1			Huber & B
<b>Natural Gas/LP Gas Leak</b>	3	8	M1		7	Notify
<b>CO Investigation</b>		8	M1 (illness only)			
<b>Vehicle Accident</b>	4		M1			
I-75 South of Northwoods	4		M1			Butler Fire
I-75 North of Northwoods	4		M1			Tipp Fire
<b>Aircraft Crash</b>	2,3,4, BTFD	8	M1		7	Airport F
<b>Hazardous Materials</b>	4	8	M1		7	
<b>Bomb Threat/Scare</b>	3	8	M1			
<b>Washdown</b>	3					
I-75 South of Northwoods	4					Butler Fire
I-75 North of Northwoods	4					Tipp Fire

*Revised 3/1/05*

