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**Assessing the Physical Fitness Practices within the Bedford Fire Department**

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165 Center Rd.  
Bedford, Ohio 44146

A research project submitted to the Ohio Fire Executive Program  
28 May 2008

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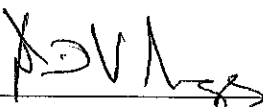
28 May 2008

## 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.

Signed: 

Printed Name: DAVID J. NAGY

## ABSTRACT

The Bedford Fire Department has a voluntary fitness participation policy. The department has a well equipped strength and cardiovascular facility. Fitness assessments, customized exercise programs, nutrition programs, and data collection to measure progress are available to the firefighters.

The problem this study investigated was why the firefighters are not taking full advantage of the available fitness resources.

The purpose of this study was to determine whether voluntary participation in physical fitness activities is adequately addressing the needs, short and long term, of the firefighters of the Bedford Fire Department (BFD).

Descriptive research was used to answer three questions:

1. What are the perspectives of the firefighters of the BFD toward physical fitness?
2. What factors prompt firefighters of the BFD to participate in fitness activities?
3. How can firefighter participation in physical fitness activities be improved?

Procedures utilized for this applied research project included literature review and a survey of the firefighters of the BFD. All data was obtained from Internet research, Ohio Fire Executive and Executive Fire Officer Research Projects, NFPA Standards, departmental statistics and information gathered in the departmental survey.

The results indicated that BFD firefighters accept their physical fitness obligation. Actions of the firefighters showed that they are attempting to fulfill this obligation however the results gained from their efforts are debatable. The effectiveness of the current voluntary fitness participation policy was questionable. An incentive for individual improvement may increase firefighter fitness participation practices. There was support for implementation of a

mandatory, non-punitive fitness participation policy.

Recommendations included a cooperative labor and management effort to establish a fitness committee, a mandatory fitness participation departmental policy, and comprehensive individualized fitness programs with tracking of results. A wellness program to augment the mandatory fitness participation policy should also be considered.

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## INTRODUCTION

### Statement of the Problem

Peter Matthews (2007) reported that since 2004 there have been 336 line-of-duty deaths (LODD) in the American Fire Service. Heart attacks accounted for 159 (47.3%) of those deaths and 12 deaths (3.6%) were the result of strokes. These statistics indicated that half of the firefighter LODD during this period could be attributed to a cardiovascular incident. The National Fire Protection Association (NFPA) revealed that 38% of the 89 firefighter fatalities in 2006 were the result of a sudden cardiac event (2007).

On February 20, 2006 The National Fallen Firefighters Foundation (NFFF) reported that while health and fitness issues are emphasized and widely supported, in principle, the lack of physical fitness is often tolerated and individuals who die as a result of being unfit are honored as heroes. The NFFF noted that the fire service tends to consider a line of duty death an acceptable outcome, while compelling an individual to meet a physical fitness standard is somehow considered unfair. The report went on to conclude that this is seemingly a “cultural issue” that is almost entirely internal to the fire service (NFFF, 2006).

In an analysis of U.S Fire Administration data Gerardi (2007) found that in a three year span, 2002 through 2004, sprains and strains were the leading classification of firefighter injuries. In 2004 sprains and strains accounted for 48.5% of fireground injuries.

The Fire Service Joint Labor Management Wellness-Fitness Initiative (1997, p. 43) has “shown the need for firefighters to maintain high levels of aerobic fitness, muscular endurance, and muscular strength to perform safely and effectively in the fire service.”

The Bedford Fire Department (BFD) currently has a well equipped strength and cardiovascular facility, fitness assessments, customized exercise programs, nutrition/dietary

programs, fitness education, and data collection to measure progress available to the firefighters. A review of firefighter on-duty physical fitness participation records and information obtained in a meeting with the department's Peer Fitness Trainer (PFT) indicated these resources are not being fully utilized by the firefighters. Participation in physical fitness activities and resource utilization is voluntary. *The problem this study investigated was why the firefighters are not taking full advantage of the available fitness resources.*

### **Purpose of the Study**

*The purpose of this study was to determine whether voluntary participation in physical fitness activities is adequately addressing the needs, short and long term, of the firefighters of the BFD. The information gained in this study will be utilized, in cooperation with labor, to identify strategies that can be exercised in implementing a comprehensive physical fitness program and achieve full participation by firefighters.*

The research method chosen for this study was descriptive.

### **Research Questions**

*The following questions were answered by this descriptive research:*

- 1. What are the perspectives of the firefighters of the BFD toward physical fitness?*
- 2. What factors prompt firefighters of the BFD to participate in fitness activities?*
- 3. How can firefighter participation in physical fitness activities be improved?*

## **BACKGROUND AND SIGNIFICANCE**

Bedford, Ohio is a community of 14,214 citizens (U.S. Census Bureau, 2000), with a land area of 5.30 square miles located in the southeast region of Cuyahoga County. Thirty nine



percent of land use is designated as residential, 16.5% as metro parks, 8.8% commercial, 7.4% public and institutional, and 3.3% industrial (City of Bedford Master Plan, 1997). Sections of interstate highway and railroad add to potential hazards which may require mitigation by the firefighters of the BFD. In 2006 the fire department responded to 2046 calls (fire and emergency medical). During the time period, 1995-2006, the overall call volume of the department has steadily increased by 27% (Bedford Fire Department, 2006).

The fire department utilizes modern fire apparatus, firefighting equipment, specialized rescue equipment, patient care and transport equipment. Firefighter safety, equipment weight and ease of usability are taken into account prior to equipment purchase.

On site physical fitness equipment has been available to the firefighters since 1985. The equipment and facilities have frequently been upgraded. Equipment maintenance is performed on a regular basis.

The department has a voluntary participation policy regarding physical fitness activities. On duty physical fitness time is allocated for members, it is part of the daily schedule, but participation remains voluntary. In 2004 the amount of time that was designated for on duty physical fitness participation doubled, increasing from two hours to four hours; however the participation levels have seemingly not increased accordingly. Records indicated that from 2004 to 2006 there was a 17% increase in hours spent by members using the facility.

There is a firefighter on the department who has the ability to function as a PFT. This individual is available to supervise and encourage safe participation in fitness activities. The firefighter has an understanding of proper exercise techniques, a consistent level of competence and a scientific knowledge of exercise (WFI 1997, p.49). The PFT has completed a certified, comprehensive personal training course as well.

Fitness assessments, customized exercise programs, nutrition/dietary programs, fitness education, and data collection to measure progress are available to all members. Currently, 0 of the 29 members of the BFD are taking full advantage of these services. Seven firefighters and one Chief Officer have recently received body fat percentage analysis. The PFT has not designed a customized exercise program or diet plan since 2004.

A review of departmental data relative to firefighter injuries found that since 2004 there have been 32 reported on duty injuries, an average of eight per year. Twenty two, 69%, of those injuries were classified as sprains or strains. Eighty six percent of the sprains and strains suffered by firefighters were back related injuries.

Further examination of the incidents found that in 2004 sprains and strains accounted for 43% of the injuries. By 2007 sprains and strains were listed as the classification of 88% of the total reported injuries. Review of data during the same time period, relative to back injuries; illustrated that in 2004 back injuries accounted for 28.5% of the total injuries. By 2007, 77% of the total injuries suffered by Bedford Firefighters were back related. Data indicated that sprains and strains as well as back related injuries have accounted for a significant amount of injuries suffered by BFD firefighters. While the numbers have fluctuated from year to year overall there has been an increase in sprains and strains as well as back related injuries.

The National Fire Protection Association (NFPA) reported that in 2005 44.4% of the 80,100 injuries suffered by firefighters were sprains and strains (October, 2006). Statistics showed that during the same year sprains and strains accounted for 70% of the reported injuries experienced by firefighters of the BFD. The percentages of these types of injuries suffered by the firefighters of the BFD were greater than the average numbers reported to the NFPA.

Table 1 illustrates the number, classification and anatomical designation (back-injury) of reported injuries suffered by BFD firefighters from 2004 through 2007.

**Table 1**

*Reported Injuries Suffered by Bedford Firefighters*

Year	I	<u>Sprain or Strain</u>		<u>Back Injury</u>		
		Ns	%I	Nb	%I	%Ns
2004	7	3	42.86	2	28.5	66.67
2005	10	7	70.00	7	70.00	100.00
2006	6	4	66.67	3	50.00	75.00
2007	9	8	50.00	7	77.78	87.50
TOTAL	32	22	68.75	19	59.36	86.36

*Note. Sprain or strain is an injury classification. Back injury is a specific anatomical designation for an injury classified as a sprain or strain.*

*I = Total injuries*

*Ns = Injuries Classified as Sprain or Strain*

*Nb = Injuries that are Back Related*

Since 1998 three firefighters have been forced to retire due to physical disability. The injuries that lead to these disability retirements were suffered while on duty at the BFD. The injuries that ultimately lead to these disability retirements were initially classified as a sprain or strain. Two of these disabled firefighters suffered career ending back injuries. In a department of Bedford's size, these three members represent 10% of the firefighting team.

Fortunately the BFD has not experienced a LODD in the past three and a half decades.

In 1995 the size of the department increased from 20 members to 27 members. This represented roughly a 25% increase in staffing. Many of the newly hired firefighters were from the same age range. The current average age of a BFD firefighter is 38 years old with, on average, 12 years of service time. Over the course of the next five years anticipated service retirements will total four. In the next ten years, two additional service retirements are expected. In the year 2017 the remaining current members, 79% of the firefighting force, will have reached, on average, 45 years of age and achieved 18 years of service. These firefighters will not yet have gained the minimum retirement age of 48 or have the required service time of 25 years. By the time these individuals attain their 25 years of service, the average age of 79% of the BFD firefighters will be 52 years old. Service provided to the citizens of Bedford will be delivered by an aging department group of firefighters. An adequate level of fitness will be instrumental in determining their ability to deliver a quality, effective, and efficient service in a safe manner.

Compton (2006) asserted that many of the tasks a firefighter will become involved in require strenuous work without the luxury of a proper warm-up period. Numerous firefighters will experience career ending injuries, or worse, death due to heart attacks or strokes as a result of this dynamic. The WFI (1997, p. 43) has "shown the need for firefighters to maintain high

levels of aerobic fitness, muscular endurance, and muscular strength to perform safely and effectively in the fire service.”

Considering the rigors and physical demands of the firefighting profession and the increasing age of the firefighters of the BFD there is concern that the current practice of voluntary physical fitness and lack of participation in the fitness assessments, customized exercise programs, nutrition/dietary programs, fitness education, and data collection to measure progress will eventually prove to be detrimental to the firefighters.

*The potential impact this study could have on the Bedford Fire Department is the promotion of a complete physical fitness program with 100% participation by members. As a result of this total participation by firefighters there would be a reduced risk of injury and disability or death due heart attacks or strokes.*

## **LITERATURE REVIEW**

A report by the Surgeon General (1996) indicated that more than 60% of American adults are not regularly physically active. Twenty five percent of all adults are not active at all. The report concluded that Americans can substantially improve their health and quality of life by including moderate amounts of physical activity in their daily lives (Surgeon General, 1996).

The American Heart Association (2000) has identified factors that increase an individual's odds of suffering a heart attack or stroke. Factors such as heredity, gender, and age cannot be modified or eliminated. Cigarette smoking, high blood pressure, blood cholesterol levels and physical inactivity are risk factors that can be modified or eliminated. Factors that have been found to contribute to the risk of heart attack or stroke include diabetes, obesity, and stress. These contributory factors; diabetes, obesity, and stress as well as high blood pressure and high cholesterol may be altered by increased physical activity.

Dellarocco (2004) asserted that “if your firefighters are overweight and soft, they are a danger to themselves and a detriment to your department.” He declared that any training firefighters may participate in is useless unless they are training to meet the physical demands of their jobs. Sierra (1998) reported that the damaging effects of smoke, heat, and stress may be negated to a certain extent by regular participation in physical fitness activities. He went on to claim that by participating in fitness activities the firefighter would experience an increase in confidence and self-esteem. This would decrease the potential for premature fatigue and serious injury.

In 1997 the International Association of Fire Chiefs (IAFC) and the International Association of Fire Fighters (IAFF) developed The Fire Service Joint Labor Management Wellness/Fitness Initiative (WFI). This cooperative effort specifically addressed the issue of firefighter fitness. According to the WFI (1997) the high incidence of back injuries, sprains and strains plaguing firefighters could be linked to low levels of muscular strength.

The Ohio Administrative Code (OAC) placed the responsibility of active participation in a fitness and wellness program on the firefighter (2007). As stated by Sierra (1998), “as professionals, it is every firefighter’s responsibility to ensure that he/she has the physical capability to execute the demanding tasks that are required...at the fire scene.” Brown (2006) found that 100% of firefighters he surveyed indicated that it was their personal responsibility to stay fit and maintain the ability to perform their job.

Peacock (1998) disclosed that within the Fort Worth (Texas) Fire Department physical fitness time is designated during the shift and participation by members is encouraged. In a study of fitness participation by members of his department Brown (2006) was able to establish

that 88% of the members worked out while on duty. The majority of firefighters of the Las Vegas (Nevada) Fire Department engaged in physical fitness, every shift (Riddle, 1999).

The Surgeon General and the American Heart Association are proponents for the physical benefits that can be achieved through regular physical activity and exercise. Data indicated that firefighters must accept personal responsibility for maintaining their level of fitness in order to perform safely and effectively. Further analysis indicated that firefighters have acted on that responsibility by participation in physical fitness activities.

Lindner (1998) defined motivation as an inner force that drives individuals to accomplish personal and organizational goals. He stated that to be effective, managers need to understand what motivates employees within the context of the roles they perform. Lindner (1998) examined five theories that have merit when attempting to understand employee motivation. They are Maslow's Hierarchy of Needs, Herzberg's two-factor theory, the expectancy theory of Vroom, Adam's equity theory, and the reinforcement theory of Skinner.

Maslow (1943) contended that employees are attempting to fulfill five levels of needs. Physiological, safety, social, ego, and self-actualizing are these needs. They are listed in ascending order from lowest level need to the highest level need. Maslow proclaimed that an employee will attempt to satisfy the lower level needs prior to attempting achievement of higher level needs. Looking toward fulfillment of the higher level needs is what motivates an employee (Maslow, 1943).

Herzberg (1959) categorized motivation the result of two factors: motivators and hygienes. Job satisfaction would be produced by intrinsic factors (motivators) such as achievement or recognition. He claimed extrinsic factors (hygienes), such as pay and job security, actually produced job dissatisfaction.

Vroom (1964) based his theory on the belief that employee effort will lead to performance and performance will lead to rewards. These rewards may be positive or negative. The level of motivation of the employee is determined by the degree of reward. A highly motivated employee is the result of positive rewards while lower motivation levels are the product of negative rewards.

Adams insisted that an employee will strive for equity between themselves and co-workers. He claimed that equity is achieved when the ratio of employee outcomes over inputs equals other employee's outcome over input ratio (Adams, 1965).

Skinner (1953) stated that employee behaviors which lead to positive outcomes would be repeated. Behaviors that have negative outcomes attached would not be repeated. Employee behaviors that lead to positive outcomes should be positively reinforced by managers. The author stated that negative reinforcement should be exercised by managers when behaviors by employees resulted in negative outcomes (Skinner, 1953).

Speen (1998) claimed that unless a person is strongly self motivated, which is rare, that a favorable working environment, which is conducive to high performance, would simply not be enough to get optimum performance from that employee.

There are numerous theories that address the motivation of employees. Some employees may be driven by intrinsic forces while others are driven by extrinsic factors. As previously stated by Lindner (1998) that to be effective, managers need to understand what motivates employees within the context of the roles they perform.

The NFPA develops codes and standards that influence the operations of numerous fire departments world wide. The codes and standards are not laws however they are viewed by the courts as professional standards.



The NFPA established the minimum requirements for fire service occupational safety and health in NFPA 1500 (Fire Department Occupational Safety and Health Program, 2007 Edition). Chapter 10 of the standard outlines the medical and physical requirements that should be adhered to by the fire service. NFPA 1500 (2007, p. 1500-27) recommended that fire departments establish and provide a NFPA 1583 compliant health and fitness program. This shall be accomplished in order to develop and maintain a level of fitness which allows firefighters to perform and complete their assigned functions in a safe manner.

NFPA 1583 (Standard on Health- Related Fitness Programs for Firefighters, 2000 Edition) outlined the minimum requirements of a physical fitness program for fire department personnel. Components that are to be included in such a program:

- The assignment of a qualified health and fitness coordinator
- A periodic fitness assessment for all members
- An exercise training program that is available to all members
- Education and counseling regarding health promotion for all members
- A process for collecting and maintaining data

The WFI (1997) recommended that “management and labor shall work together to provide workout scheduling, resource support, and/or access to resources on duty to support an individualized fitness program.”

Components of a productive program include:

- Medical clearance to participate
- On duty time for exercise
- Exercise specialist and peer trainers
- The incorporation of fitness into the fire service philosophy

- Fitness evaluations of aerobic capacity, flexibility, muscular strength, and muscular endurance
- Fitness self assessments
- Exercise prescriptions

Research has found that regular exercise yields numerous health benefits. Fitness and wellness has surfaced as one of the top priorities in the fire service. The Fire Service Joint Labor Management Wellness-Fitness Initiative and NFPA 1583 provide a solid framework for a comprehensive fitness program for the fire service.

As reported in the WFI (1997) traditionally the leaders in the fire service have purchased the latest equipment available, pumpers, PASS alarms, and bunker gear yet ignored the most important assets, the firefighters and their fitness. Sierra (1998) disclosed that the Palm Beach Fire Rescue had aggressively implemented a preventative maintenance program for their vehicles and equipment however they had failed to address the issue of the health and fitness levels of their employees. The department had no routine fitness program. This was their culture.

The American Heritage Dictionary (Fourth Ed.) defined culture as “the predominating attitudes and behaviors that characterize the functioning of a group or organization.” As previously stated the NFFF (2006) found that there are cultural barriers to overcome in addressing the topic of firefighter fitness. Creation of a positive atmosphere of wellness and fitness throughout an organization is paramount. The NFFF (2006) report further indicated that a positive attitude toward fitness has to become an integral value and basic component of the fire service culture.

Compton (2006) advised that it is vital that the leadership in the fire service accept their responsibilities in order to impact health and safety in positive, practical, and effective terms. Perry (2002) maintained that if there is no buy-in at the top that the chances for success are narrowed. He claimed that a prerequisite for the success of a physical fitness program is that the chief of the department be at the forefront of this effort. As stated in the WFI (1997);

“Wellness is the fire chief’s commitment to the uniformed personnel’s quality of life. It is a commitment to the health of uniformed personnel when they come to work, respond to calls, return from calls, go home at the end of their shifts, and retire at the end of their careers.”

In order to be successful the cultural transformation must be endorsed by fire department leadership. As indicated in the OAC (2007) it is the fire chief’s responsibility to establish a health related fitness program. The program must enable firefighters to develop and maintain a level of fitness that allows them to safely perform their assigned functions. Furthermore the program shall not be punitive but focused toward improving the firefighter’s fitness and well being (OAC, 2007). The fire chief must be supportive and the firefighters must be willing to participate (WFI, 1997). This may be accomplished by providing equipment, facilities and the time to participate in physical fitness activities. Members of the department need to see that the leadership is serious about the physical conditioning of the firefighters and be willing to participate in a physical fitness program once it is established.

Peacock (1998) reported that a growing number of North American fire departments are implementing physical fitness programs. Sierra (1998) determined that fitness programs need to be presented in a manner that makes firefighters willing to participate. Wagner (1997) reported the Omaha Fire Department is making strides toward creating a workforce more aware of the

need for a worksite fitness and wellness program. He went on to say that the rank and file firefighter and the management team are beginning to develop a wellness culture.

The fitness cultural evolution will be successful only if the leadership is at the forefront of the effort. Endorsement by firefighters of a fitness program will be the next goal to accomplish during the cultural transformation.

If an individual is participating by their choice or of their own free will in a program their action is presumed to be voluntary. By contrast if participation is mandatory the action is considered to be required (The American Heritage Dictionary, Fourth Ed.). Punitive consequences, punishment, maybe associated with lack of participation in a mandatory program (The American Heritage Dictionary, Fourth Ed.). As stated in the WFI (1997) a mandatory fitness program is intended to be non-punitive. Participation is required however; individual's results are to be compared against their previous performance. The goal of the program is individual progress, competition against oneself. There is no punishment for participating.

In his study Peacock (1998) determined that voluntary programs do not motivate individuals who would benefit the most from participation. Brown (2006) contended that departments who allow voluntary participation in fitness programs fall short of 100% participation by members. His data indicated that between 10% and 20% of firefighters would not work out if the program is voluntary.

Riddle (1999) found that a mandatory program increased the participation levels and the overall fitness levels of participants. Seventy one percent of the departments he surveyed reported that their programs were mandatory. In his study Monto (2002) stated that 90% of the Maumee (Ohio) firefighters would support a mandatory physical fitness program for full time employees. Seventy one percent of the responders to Brown's (2006) survey stated they would

support a mandatory fitness program. Miller (2004) discovered that 53% of those he surveyed felt that the Ashland (Ohio) fitness program should be mandatory. That percentage increased to 64% in favor of a mandatory program that was non-punitive.

The WFI (1997) endorsed fitness programs that are individualized, positive and non-punitive. The goal of the program is individual progress, competition against oneself. All results should be compared to the individual's previous assessments and exams, not against a standard.

Research review of voluntary versus mandatory participation policies relative to physical fitness programs indicated that firefighters were in favor of mandatory participation physical fitness programs. The percentage of those in favor of a mandatory program increased if the physical fitness program was implemented as positive and non-punitive.

As previously stated the WFI (1997) endorsed management and labor working together in the formulation and implementation of a fitness program that is positive with no punitive repercussions. Once the program is implemented through mandatory participation by all uniformed personnel is required (WFI 1997).

Review of literature illustrated that physical inactivity leads to health problems and these health problems may lead to premature death or disability. A need to change the culture of the fire service regarding the way firefighters view physical fitness has been identified. The IAFC and the IAFF recognized this need for a cultural transformation and collaboratively issued the WFI. The individuality of each and every firefighter must be accounted for when trying to understand what motivates them to engage in physical fitness activities. The leaders of change need to correctly identify these motivating triggers and initiate fitness programs accordingly.

NFPA Standards and Initiatives offer guidance and supply a solid foundation to support this change. Departmental leadership must provide opportunities while leading by example to illustrate the importance of this aspect of the fire service. Leadership needs to gain the confidence and endorsement of their troops in order to facilitate this cultural transformation. All these factors should be taken into consideration and a comprehensive fitness program should be cooperatively designed, by labor and management, implemented and enforced. This fitness program must be appropriate for the department and one that will be of the most benefit to the firefighters of that department.

### **PROCEDURES**

The research for this project started with a review of journal articles, periodicals and websites dealing with firefighter health and fitness. A review of departmental policies, procedures, injury statistics and fitness activity participation data was conducted. Research papers from the Ohio Fire Executive (OFE) Program and the Nation Fire Academy's (NFA) Learning Resource Center (LRC) were analyzed. Additional information and material was obtained from the Cuyahoga County Public Library. The Fire Service Joint Labor Management Wellness-Fitness Initiative and NFPA Standards on firefighter health, wellness, and fitness were examined.

A survey of the department's 28 uniformed firefighters was conducted to gather data relative to physical fitness. A department roster was utilized to insure that each firefighter received a survey. The survey was completed over a week long period. Firefighters were advised of the study and that participation in the survey was voluntary. Instructions were given to firefighters to not place their names on the survey and place their completed survey into an unmarked envelope. This was done to insure the firefighter's anonymity. The researcher was

present the entire time the surveys were being completed.

The survey consisted of ten close-ended questions. The questions asked were intended to gain information and insight as to whether firefighters felt a personal responsibility to maintain their physical fitness level, a self assessment of their current fitness level and how often firefighters participated in fitness activities while on duty. Feedback on factors that compelled individuals to workout, if leadership endorsed physical fitness participation, mechanisms to increase physical fitness participation, and if a mandatory, non-punitive physical fitness program would be supported by firefighters was gathered.

The President and Vice-President of the Firefighters Local 1683 conducted a review of the questions and were asked for feedback prior to distribution of the survey. Questions that the labor representatives determined to be confusing or potentially controversial were eliminated or changed.

The surveys were collected by the shift officer and returned to the researcher. The data obtained in the surveys was analyzed by the researcher and a representative of the Bedford Firefighter's Union Local 1683.

A copy of the survey that was distributed to firefighters is included as Appendix 1, and the survey results are included as Appendix 2.

### **Limitations of the Study**

Participating firefighters may have given deceptive answers to the survey questions. In this case, the results would not be indicative of the true opinions of the BFD Firefighters.

It is important to note that the Bedford Firefighter's Union Local 1683 and the City of Bedford were actively involved in contentious contract negotiations during the time of the study.

During the time of the study and survey the Bedford Fire Department contracted with a neighboring community to provide fire and EMS service to their Village. This increased responsibility (i.e. call volume) was opposed by several firefighters with varying levels of intensity.

It is worth pointing out that a previous attempt, approximately twelve years ago, to implement a mandatory physical fitness program was opposed. The proposed program was unilaterally imposed by management without consultation or endorsement of labor. The attempt ultimately failed.

These situations may have influenced answers given by BFD firefighters.

## **RESULTS**

The results utilized for this research project were obtained through a survey of BFD firefighters. All of the 28 firefighters of the BFD completed a survey relating their opinions on physical fitness, the current physical fitness practices of their fellow firefighters and current or future departmental physical fitness policies.

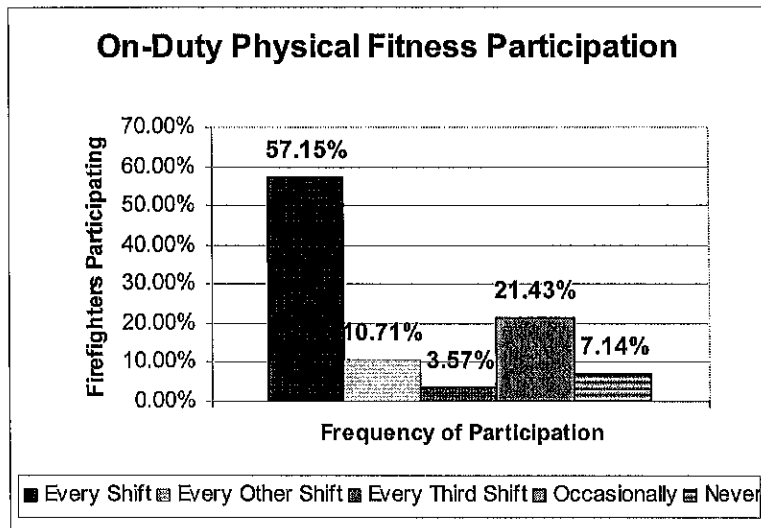
### **Question One**

*What are the perspectives of the firefighters of the BFD toward physical fitness?*

One hundred percent of firefighters surveyed (28) stated it is their responsibility to remain physically fit in order to be able to perform their duties as a firefighter.

Sixteen firefighters (57.15%) responded that they worked out while on-duty every shift. Three (10.71%) claimed to workout every other shift. One (3.57%) admitted to working out every third shift. Six members (21.43%) stated they participate in working out on-duty occasionally. Two firefighters (7.14%) admitted they never work out while on-duty.





**Figure 1.**

Nineteen (67.86%) responded that their current fitness level needed to be improved.

Nine firefighters (32.14%) rated their current physical fitness level as adequate.

Firefighters admitted to accepting the responsibility for the maintenance of their fitness levels. Numbers indicated that many firefighters are making in effort while on-duty to improve their level of fitness by participating in physical fitness activities. The majority of those surveyed felt as though their level of fitness could be improved.

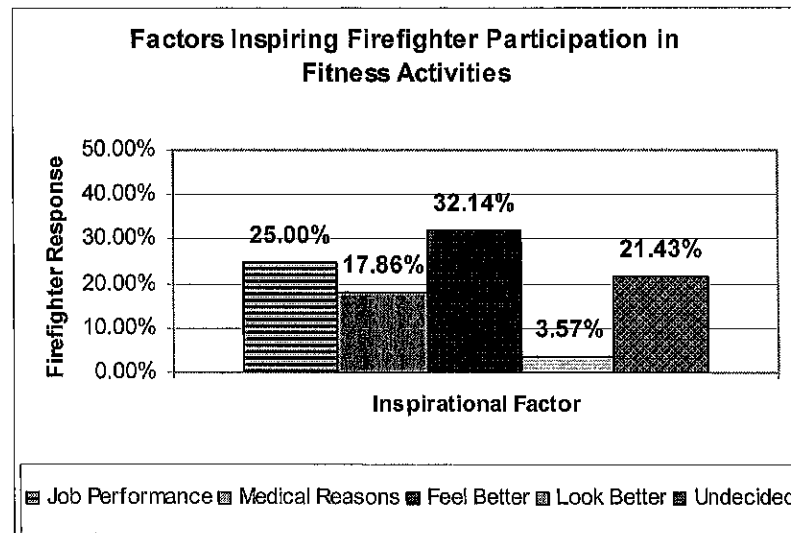
### **Question Two**

*What factors prompt firefighters of the BFD to participate in fitness activities?*

Five factors were listed in order to determine what prompted the firefighters to participate in fitness activities. The factors were:

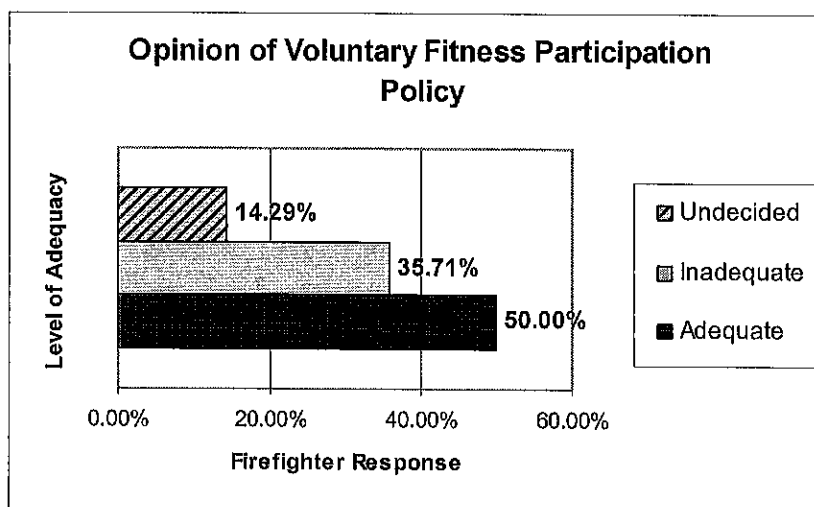
- Job performance: seven (25%) firefighters chose this as their response.

- Medical reasons: five (17.86%) firefighters chose this as their response.
- Feel better: nine (32.14%) firefighters chose this as their response.
- Look better: one (3.57%) firefighter chose this as their response.
- Undecided: six (21.43%) firefighters chose this as their response.



**Figure 2.**

Firefighters were surveyed relative to the voluntary physical fitness participation policy of the department adequately addressing the fitness needs of fellow firefighters. Fourteen firefighters (50%) stated it was adequately addressing their fellow firefighter's fitness needs. Ten firefighters (35.71%) answered that it was not addressing the fitness needs. Four firefighters (14.29%) were undecided on this issue.



**Figure 3.**

Firefighters were asked if an incentive for voluntary participation in physical fitness activities would increase their participation. Fifteen (53.57%) answered that their participation would increase. Twelve (42.86%) claimed that an incentive would not increase their participation levels. One firefighter (3.57%) was undecided on this topic.

Firefighter's reasons for participation in fitness activities varied. Opinions were divided on the effectiveness of the voluntary physical fitness participation policy as well as the effects of implementing an incentive based participation policy.

### **Question Three**

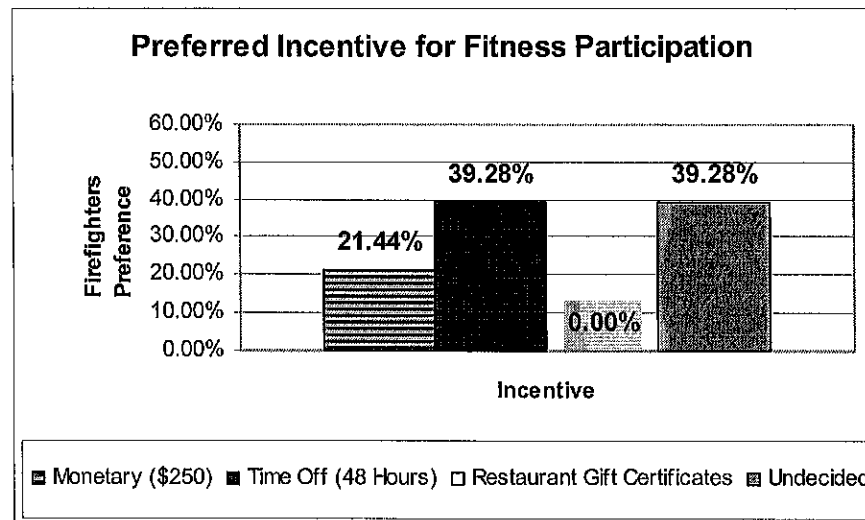
*How can firefighter participation in physical fitness activities be improved?*

Twenty six (92.86%) of those surveyed felt as though leadership endorsed regular physical fitness participation. One firefighter (3.57%) answered that leadership did not endorse participation and one (3.57%) firefighter was undecided on this question.

The following incentives for participation were presented to those completing the survey:

- Monetary reward (\$250.00): six (21.44%) chose this as their answer.

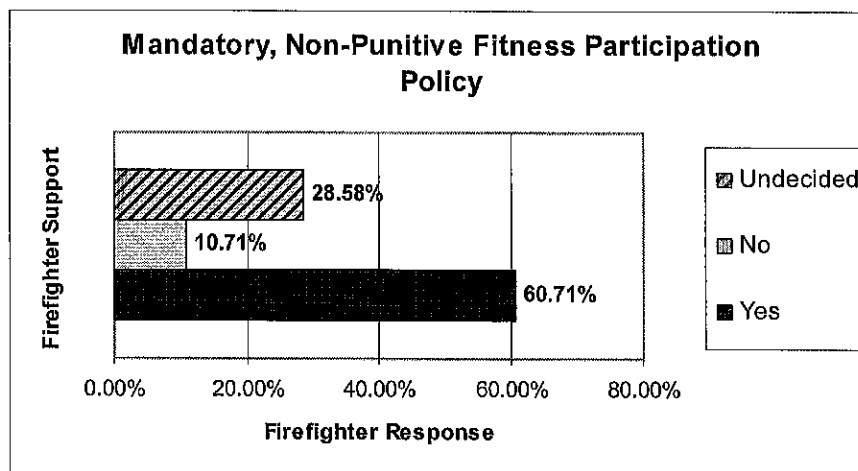
- Time off (48 hours): eleven (39.28%) firefighters chose this as their answer.
- Restaurant gift certificates: zero firefighters chose this as their answer.
- Undecided: eleven (39.28%) chose this as their response.



**Figure 4.**

Twenty one (75%) firefighters answered that a set on-duty work out time, barring emergency runs, would increase their participation in physical fitness activities. Five firefighters (17.86%) indicated that a set time would have no effect on their participation in a fitness program. Two (7.14%) firefighters were undecided on this issue.

Seventeen (60.72%) firefighters expressed support for implementation of a mandatory, non-punitive fitness program. Three firefighters (10.71%) were against implementation of this type of program. Eight firefighters (28.57%) were undecided about implementation of this type of program.



**Figure 5.**

Numbers indicated that the perception among the firefighters is that leadership endorses physical fitness participation. If a decision was made to implement an incentive for participation fitness program opinions were split regarding what type of incentive would increase participation. Firefighters seemingly would like to have a designated on-duty time allotted for fitness participation. There was expressed support for implementation of a mandatory, non-punitive fitness program.

### **DISCUSSION**

Firefighting is a physically demanding and rigorous profession. In order to be effective and operate safely it is imperative that firefighters achieve and maintain high levels of physical fitness. Many times firefighters experience potentially career and life altering events due to a lack of physical conditioning. Literature review as well as data analysis of fatalities and injuries suffered by firefighters nationwide and injuries suffered by firefighters of the BFD support this declaration.

Sierra (1998) declared that “as professionals, it is every firefighter’s responsibility to ensure that he/she has the physical capability to execute the demanding tasks that are required...at the fire scene.” He also claimed that the damaging effects of smoke, heat, and stress may be negated to a certain extent by participating in regular physical fitness activities (Sierra, 1998). The benefits of regular participation in fitness activities for firefighters should be undisputed.

The first research question was intended to determine the perspectives of the BFD firefighters toward physical fitness.

According to the Ohio Administrative Code (OAC) active participation in a fitness and wellness program is the firefighter’s responsibility (2007). Riddle (1999) claimed that the majority of Las Vegas (Nevada) firefighters engage in physical fitness activities every shift. Twenty eight (100%) of the BFD firefighters surveyed agreed that it is their responsibility to maintain an adequate level of physical fitness which allows them to effectively perform the duties of a firefighter. Data gained through the survey showed that almost 93% of BFD firefighters participate in physical fitness activities while on duty, albeit with varying frequency. These results were similar to those of Brown (2006) who found that 88% of the firefighters of the Blue Ash Fire Department worked out while on duty. Firefighter’s actions are indicative of an acceptance of the responsibility to maintain adequate personal fitness levels.

Further examination of Brown (2006) found that only 40% of the firefighters he surveyed worked out every shift, roughly 24% every other shift, and almost 24% occasionally. Comparative analysis found that just over 57% of BFD firefighters reported working out every shift, roughly 11% every other shift, and approximately 24% occasionally. The participation

percentages for the firefighters of the BFD were slightly greater than those reported by Brown (2006).

Considering those findings the author was forced to question the fitness participation patterns of BFD firefighters. If exercise is not occurring regularly (every shift, or once every third day) then perhaps the full benefits of fitness participation are not being achieved. The author contends that the close to 68% percent of those surveyed who indicated their current fitness level needed improvement substantiate this claim.

The firefighters of the BFD have assumed the responsibility for maintaining their fitness levels. Data illustrates that they are acting on this responsibility by participating in fitness activities while on duty. There is a reported lack of achievement of adequate physical fitness levels by the BFD firefighters. The author alleges that a lack of regular physical fitness participation is hindering the firefighters from achievement of their optimal fitness levels.

Question number two was intended to determine the factors that prompt the BFD firefighters to participate in fitness activities.

The author found that the two most common responses given as the greatest inspirational factors influencing participation were feeling better (just over 32%) and job performance (25%). The responses of BFD firefighters were discovered to be common answers given to similar questions found through out the literature review. It would seem that the intrinsic factors, motivators, described by Herzberg (1959) could be applied when describing the factors that prompt the BFD firefighters to participate in physical fitness activities.

Speen (1998) contended unless an individual is strongly self-motivated that a favorable work environment, one conducive to high performance, will simply not be enough to get optimal performance from an employee.

As previously stated firefighters of the BFD have a wide variety of modern on-site strength and cardiovascular equipment available for their use. Time is allotted for physical fitness. Fitness assessments, customized exercise programs, nutrition/dietary programs, fitness education and data collection to measure progress are available to all firefighters. It is the author's opinion that a favorable work environment as described by Speen (1998) exists at the BFD. Responses indicated that the facilities, available resources, and a voluntary participation policy are not providing adequate inspiration toward achieving full, regular participation in fitness activities by firefighters of the BFD.

Only 50% of firefighters reported feeling as though the voluntary participation policy of the department adequately addresses the fitness need of their co-workers. These findings mirrored those of Peacock (1998) who found that voluntary programs do not motivate the individuals who would benefit most from participation.

This data in combination with the previously reported need for fitness improvement by BFD firefighters as well as fitness participation patterns lead the author to believe that self motivation is not yielding the desired results. If self motivation for fitness participation does not adequately address the fitness needs of the BFD firefighters then an incentive for participation fitness program warranted consideration.

Vroom (1964) claimed that the motivational level of an employee could be correlated to the associated reward. Positive rewards yielded higher motivation levels than did negative rewards (consequences). Skinner (1953) maintained that employee behaviors which lead to positive outcomes would be repeated. The author considers an incentive for participation program is to be a reward or positive outcome.



Data relative to the firefighter's view point of implementing an incentive for participation in fitness activities was obtained. Opinions of the BFD firefighter were divided on this possibility. Fifteen (almost 54%) stated their participation would increase if there were an incentive program to participate versus twelve (almost 43%) who claimed an incentive program would not alter their participation patterns.

Firefighters of the BFD responses varied when asked to disclose the factors that prompt them to participate in physical fitness activities. The author is doubtful that the voluntary participation in physical fitness activities adequately addresses the fitness needs of the BFD firefighters. The effectiveness of an incentive based policy was questionable as well.

Research question number three attempted to gather information that would be useful in determining how firefighter participation in fitness activities could be improved.

As mentioned earlier the possibility of implementing an incentive for participation fitness program was evaluated. Opinions were divided regarding the effectiveness of this type of program. However the author felt as though this option warranted further exploration and information relative to effective incentives was obtained.

In his study Brown (2006) established that some form of monetary incentive would be a motivator for individuals to participate in physical fitness activities. Miller (2004) also determined that within the Ashland (Ohio) Fire Department that some type of monetary incentive would provide motivation for firefighters to workout. Roughly 21% of BFD firefighters listed this as their preferred incentive.

These results gathered from BFD firefighters again favored the theory of Herzberg (1959). He claimed extrinsic factors (hygiene), such as pay and job security, actually produced job dissatisfaction. The author considered an incentive based program to be hygiene. Financial

incentive would not provide the same inspiration to the BFD firefighters to participate in fitness activities when compared to findings of similar studies. A different incentive for a fitness participation program needed to be determined.

Just over 39% of BFD firefighters surveyed indicated that time off would provide the greatest inspiration in an incentive for participation based fitness program. These results were similar to those of Brown (2006). He found that close to 38% of those he surveyed would favor time off as an incentive for participation. If an incentive based program were to be introduced the author is confident that time off would be an effective incentive.

As stated in the WFI (1997) “wellness is the fire chief’s commitment to the uniformed personnel’s quality of life.” Perry (2002) stated that in order to have a successful fitness and wellness program there must be buy in at the top. Compton (2006) advised that it is vital that the leadership in the fire service accept their responsibilities in order to impact health and safety in positive, practical, and effective terms.

Results from the survey indicated that the majority of the firefighters, almost 93%, felt that the leadership of the BFD endorsed regular physical fitness participation. The management of the BFD has exhibited their commitment toward establishing the requisite fitness culture as described by the NFFF (2006).

Examination of the WFI (1997) found that a key component to a successful fitness program is designating the time for firefighters to participate. The results of the survey indicated that the BFD firefighters (75%) just want to have the time, barring emergency runs, allotted for physical fitness activities. This number was significantly higher than those reported by Brown (2006), 55%, and Miller (2004), 44%, when they posed a similar question. It is the author’s opinion that these findings require further examination. Many concerns have surfaced over this

response since members already have four hours, between 8am and 5pm, each day allotted specifically for physical fitness participation.

Peacock (1998) reported that a growing number of North American fire departments are implementing physical fitness programs. Sierra (1998) claimed that fitness programs need to be presented in a manner that makes firefighters willing to participate. NFPA 1583 provides definitive components that should be included if productive fitness programs are to exist within a department. The WFI (1997) endorses fitness programs that are individualized, positive and non-punitive.

Sierra (1998) determined that a mandatory program increased the participation levels and the overall fitness levels of participants. Monto (2004) found 90% of Maumee (Ohio) firefighters would support a mandatory fitness program. Seventy-one percent of Blue Ash (Ohio) firefighters would support this type of program (Brown, 2006). Miller (2004) found roughly 64% of those he surveyed would support a mandatory, non-punitive, fitness program.

When surveyed roughly 61% of the BFD firefighters claimed they would support a mandatory, non-punitive, fitness program as outlined in the WFI (1997). This percentage is slightly lower than the results of similar research relative to firefighter support of a mandatory, non-punitive, fitness program.

The author found it interesting that slightly more than 28% (eight) of those surveyed marked their answer as “undecided” on this topic. It is the opinion of the author that perhaps a better understanding of NFPA 1500, NFPA 1583, and WFI (1997) by the firefighters of the BFD may have positively influenced those who were undecided on the implementation of a mandatory, non-punitive, fitness program to support this type of program.

An effective incentive, time off in the form of compensatory hours, has been identified if the determination to implement an incentive for participation policy is deemed appropriate. The leadership of the BFD has achieved the goal of endorsing regular physical fitness participation. A perception of inadequate time for fitness participation has been identified and will require additional analysis. There is optimism that with some education of the BFD firefighters relative to NFPA Standards as well as the WFI that additional support for a mandatory participation fitness policy can be obtained.

Review of literature found that physical inactivity leads to health problems and these health problems may lead to premature death or disability. NFPA 1500 (2007, p. 1500-27) recommends that fire departments establish and provide a NFPA 1583 compliant health and fitness program. The WFI has outlined an appropriate action plan to achieve this fitness participation objective. This objective must be accomplished in order to develop and maintain a level of fitness which allows firefighters to perform and complete their assigned functions in a safe manner. The WFI (1997, p. 43) has “shown the need for firefighters to maintain high levels of aerobic fitness, muscular endurance, and muscular strength to perform safely and effectively in the fire service.”

The firefighters of the BFD have accepted their responsibility to maintain a personal level of physical fitness enabling them to perform the job of firefighter. Several firefighters participate in fitness activities while on duty but with irregular frequency. Many firefighters reported that their level of physical fitness needed improvement.

The voluntary participation policy of the department is apparently not adequately addressing the fitness needs of all BFD firefighters. An incentive based participation program maybe effective. The introduction of time off as an incentive to participate could be an effective

strategy toward achieving full membership fitness participation. It seems that firefighters really only want to have time allotted to them, while on duty, in order to participate.

The leadership of the department has experienced positive feedback relative to their endorsement of physical fitness participation and ultimately toward promotion of a fitness culture within the BFD. A mandatory participation program may be successful within the department. Success would be dependent on educating the firefighters and working with labor to implement this type of fitness program.

The WFI and NFPA Standards have provided a definitive outline of what elements are necessary in order to implement and maintain a successful wellness and fitness program. It is up to the leadership and firefighters to take the next step and embrace such a program.

### **RECOMMENDATIONS**

The Bedford Fire Department has had a voluntary physical fitness participation policy in place for years. The department has a well equipped, and maintained, strength and cardiovascular facility on-site available for firefighters to use while on-duty. Personalized fitness and nutrition programs are available to all members. The problem that has been identified is that the firefighters of the BFD are not taking full advantage of the available resources. The purpose of the study was to determine whether the voluntary physical fitness participation policy is adequately addressing the needs of the BFD firefighters.

Based on the research gathered in this study the following recommendations should be implemented:

1. It is recommended that management and labor work toward establishing a fitness committee. The committee should have labor and management representatives.

2. It is recommended that a comprehensive physical fitness program be implemented. This program should be based on NFPA 1583 and the guidelines outlined in the IAFC/IAFF Joint Labor Management Wellness and Fitness Initiative. The program should be mandatory and non-punitive. The possibility of implementing an incentive based program should be considered. The Fitness Committee should design and implement the program.
3. It is recommended the Fitness Committee and the Personal Fitness Trainer gather baseline fitness data on all firefighters in the department. The data shall be evaluated at regular intervals in order to assess individual improvement.
4. It is recommended that management and labor investigate the results of the survey relative to firefighters not being allotted adequate on-duty time to participate in physical fitness activities.
5. It is recommended that the Fitness Committee explore the possibility of establishing a wellness component to compliment the fitness program.

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**APPENDIX 1 – BEDFORD FIRE FITNESS SURVEY**

1. Do you think that it is your responsibility to stay physically fit to be able to perform your duties as a firefighter?
  - Yes
  - No
  - Undecided
2. How would you rate your current level of physical fitness?
  - Adequate
  - Needs improvement
  - Undecided
3. How often do you workout while on duty?
  - Every shift
  - Every other shift
  - Every third shift
  - Occasionally
  - Never
4. Do you feel the leadership of the fire department endorses regular physical fitness participation?
  - Yes
  - No
  - Undecided
5. Which factor is the greatest inspiration to you to participate in physical fitness activities?
  - Job performance
  - Medical reasons
  - Feel better
  - Look better
  - Undecided

6. Would an incentive for participation increase your voluntary participation in physical fitness activities?
  - Yes
  - No
  - Undecided
7. Which of the following incentives would most inspire you to participate and show annual individual improvement in a fitness program?
  - Monetary reward (\$250.00)
  - Time off (48 hours Comp Time)
  - Restaurant gift certificates
  - Undecided
8. Would a set on-duty workout time, barring emergency runs, increase your participation in a physical fitness program?
  - Yes
  - No
  - Undecided
9. Do you think the voluntary physical fitness participation policy of the department adequately addresses the fitness needs of your co-workers?
  - Yes
  - No
  - Undecided
10. Would you support a mandatory, non-punitive, fitness program [developed by BFD Labor and Management in accordance with guidelines listed in the IAFF / IAFC Joint Wellness and Fitness Initiative] to insure your co-workers are fit to do the job as a firefighter?
  - Yes
  - No
  - Undecided

## APPENDIX 2 – SURVEY RESULTS

	<u>Total # of People</u>	<u># of People</u>	<u>% of Department</u>
<b>1. Do you think it is your responsibility to stay physically fit to be able to perform your duties as a firefighter?</b>			
Yes	28	28	100.00%
No	28	0	0.00%
Undecided	28	0	0.00%
<b>2. How would you rate your current level of physical fitness?</b>			
Adequate	28	9	32.14%
Needs improvement	28	19	67.86%
Undecided	28	0	0.00%
<b>3. How often do you work out while on duty?</b>			
Every shift	28	16	57.15%
Every other shift	28	3	10.71%
Every third shift	28	1	3.57%
Occasionally	28	6	21.43%
Never	28	2	7.14%
<b>4. Do you feel the leadership of the fire department endorses regular physical fitness participation?</b>			
Yes	28	26	92.86%
No	28	1	3.57%
Undecided	28	1	3.57%
<b>5. What factor is the greatest inspiration to you to participate in physical fitness activities?</b>			
Job performance	28	7	25.00%
Medical reasons	28	5	17.86%
Feel better	28	9	32.14%
Look better	28	1	3.57%
Undecided	28	6	21.43%

	<u>Total # of People</u>	<u># of People</u>	<u>% of Department</u>
<b>6. Would an incentive for participation increase your voluntary participation in physical fitness activities?</b>			
Yes	28	15	53.57%
No	28	12	42.86%
Undecided	28	1	3.57%
<b>7. Which of the following incentives would most inspire You to participate and show annual individual Improvement in a fitness program?</b>			
Monetary reward (\$250.00)	28	6	21.43%
Time Off (48 hours comp time)	28	11	39.29%
Restaurant gift certificates	28	0	0.00%
Undecided	28	11	39.29%
<b>8. Would a set on-duty work out time, barring emergency runs, increase your participation in a physical fitness program?</b>			
Yes	28	21	75.00%
No	28	5	17.86%
Undecided	28	2	7.14%
<b>9. Do you think the voluntary physical fitness participation policy of the department adequately addresses the fitness needs of your co-workers?</b>			
Yes	28	14	50.00%
No	28	10	35.71%
Undecided	28	4	14.29%
<b>10. Would you support a mandatory, non-punitive, fitness program [developed by BFD Labor and Management in accordance with guidelines listed in the IAFF/IAFC Joint Wellness and Fitness Initiative] to insure your co-workers are fit to do the job as firefighter?</b>			
Yes	28	17	60.71%
No	28	3	10.71%
Undecided	28	8	28.57%