

Running head: PROPER STAFFING LEVELS FOR THE TOWNSHIP OF LOWER

Proper Staffing Levels for the Township of Lower Merion Fire Prevention Office

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I hereby certify that this paper constitutes my own product, that where 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.

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

## ABSTRACT

Prevention is one of the most important aspects of any large organization or company. In the fire service, the fire prevention office covers these activities. When most people think about the fire service they usually only think of suppression and fire prevention for many departments takes a back seat and usually is one of the first to be cut during challenging economic times. The problem addressed by this research paper is that the Lower Merion Township Fire Department fire prevention workload has continued to increase while staffing has remained the same and a comparison has not been conducted. In March of 2010, staffing was again decreased due to the retirement of its Deputy Chief, and a current decision by the Township Manager not to fill any vacant positions for budgetary reasons.

The purpose of this research project was to determine the actual workload of the Lower Merion Fire Department and compare it to present fire prevention staffing levels, in order to develop and recommend a proper staffing model to proactively protect the community. The descriptive research method was used to conduct this project and consisted of a review of published materials, conducting questionnaires and surveys of other fire departments, performing internal surveys, as well as personal interviews. This was completed in an attempt to answer the following questions: a) What are the work requirements for fire prevention inspectors; b) what is the present fire prevention staff work level capability; c) what fire prevention workload will not be accomplished under present fire prevention staffing levels?

The results of this research showed staffing as compared to the current workload is insufficient and the findings of this research will be used as a basis for requesting and justifying the need for additional fire prevention staffing in the Lower Merion Fire Department.

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## INTRODUCTION

Benjamin Franklin, the father of our fire service is credited with the statement “An ounce of preventions is worth a pound of cure” (Independence Hall Association, 1999-2010, expression 67). This is obvious to many people and businesses and therefore many large organizations and businesses have created risk management departments or programs. These programs are designed to identify, contain, reduce or eliminate the potential for harm to the business or company. Like a business, the fire service is in the business of providing fire protection services to protect people and their property from fires. Therefore in order to reduce the loss of life and property, the fire department must look to embrace this risk management concept and come up with programs that are designed to reduce risk. In most departments, this is assigned to a fire prevention office, division, or unit. The Township of Lower Merion has a career fire marshal’s office and although fire prevention is not a dedicated unit within this office, it is a shared responsibility of the office.

This project will address the research problem of the Lower Merion Township Fire Department fire prevention workload has continued to increase while staffing has remained the same and a comparison has not been conducted. In March of 2010 staffing was once again reduced due to the retirement of its Deputy Chief, and a decision by the Township Manager not to fill any vacant positions in the Township in order to recognize budgetary savings in these challenging economic times. This project will also address the research purpose of determining the actual workload of the Lower Merion Fire Department and comparing it to present fire prevention staffing levels, in order to develop and recommend a proper staffing model that will

be able to provide a comprehensive risk management program for the residents, business owners, and guests of the Township of Lower Merion.

The descriptive research method was used to conduct this project and consisted of a review of published materials, conducting questionnaires and surveys of other fire departments, performing internal surveys, as well as personal interviews. This was completed in an attempt to answer the following questions: First, what are the work requirements for fire prevention inspectors? Second, what is the present fire prevention staff work level capability? Third, what fire prevention workload will not be accomplished under present fire prevention staffing levels? The questions asked and the answers provided were evaluated in order to provide background that will be used as a basis for determining the need of fire prevention staffing in the Lower Merion Fire Department, in order to provide a true comprehensive fire prevention program for its citizens.

## BACKGROUND AND SIGNIFICANCE

Lower Merion is a Township of the First Class as designated by the Commonwealth of Pennsylvania due to its population density of 300 inhabitants per square mile and is located in the southeast portion of Montgomery County, Pennsylvania. Lower Merion is a 23.64 square mile suburb that is bounded by the City of Philadelphia, the Boroughs of Conshohocken and West Conshohocken, and the Townships of Upper Merion and Whitmarsh in Montgomery County, and by the Townships of Haverford and Radnor in Delaware County. The Township is primarily residential in land-use with mixed-use commercial and retail corridors interspersed throughout. As of the 2010 census, the Township has 57,825 residents, which is a drop of 915 residents from the 2000 census. The residential areas include large estates, single-family homes on multi-acre to quarter-acre parcels, apartment and condominium buildings, twin homes,

cottages and row houses. There are numerous large institutions including educational, non-profit, arts, medical and ecclesiastical complexes.

The entity known as the Lower Merion Fire Department became official through the passage of an ordinance in 1908. In 1929 this ordinance was again amended with the passage of Ordinance Number 329, in order to appoint a fire marshal and add the fire department administrative office.

The current Fire Department consists of a fire department administrative office and seven volunteer fire companies, six of which are within the Township boundaries and one in the Borough of Narberth, together these fire companies respond to over 1600 calls per year. The Volunteer Medical Service Corps of Lower Merion and Narberth (VMSC) provide emergency medical services (EMS) to the Township with a combination of volunteer and paid personnel who respond to over 5,000 calls per year. Although the VMSC operates independently of the Lower Merion Fire Department, the fire department office does provide minimal support to the VMSC.

The Lower Merion Fire Department volunteer fire companies have approximately 250 volunteer firefighters and each of the six Township fire companies employs three full-time employees, and additional part-time employees on an as needed basis to cover weekends and holidays. The Borough of Narberth Fire Company also employs two full time employees to cover their station. While on duty these employees drive the apparatus and perform maintenance and housekeeping duties around the firehouse. Although the Township provides the funding to pay the fire company employees, they are strictly employees of the fire companies. The fire companies being very parochial and guarded in their nature, will not allow these employees to be used by the township to supplement our fire prevention activities.

The primary mission of the Lower Merion Fire Department has always been “to provide the highest level of fire protection necessary to minimize life and property losses through stringent code regulation, fire prevention and improved suppression capability” and although that will not change, what has changed is how the fire service deploys and operates in order to fulfill its multifaceted mission both nationally and on the local level.

To accomplish this, the Township employs one full-time Chief Fire Officer, one Deputy Chief, however this position has remained unfilled since March of 2010 due to budgetary reasons, an Administrative Secretary and three Deputy Fire Marshals who are responsible for conducting fire and life safety inspections in more than 2,300 properties, conducting fire investigations, conducting public educational programs, providing training to the volunteer firefighters and supplementing the volunteer fire crews with fire suppression. In addition, the Lower Merion Fire Department Office (FDO) has the primary responsibility for managing a complete fire prevention program.

According to former Lower Merion Fire Department Chief Fire Officer Harry Knorr, Jr., when he first came to the Lower Merion Fire Department in 1980, the fire department office was unprofessional, had no plan or defined mission, especially in the area of a fire inspection program (H. R. Knorr, Jr., personal communication, January 27, 2011). It is the feeling of Chief Knorr that an inspection program is the backbone of any fire prevention program. In order to institute an inspection program, Chief Knorr divided the Township into “inspection blocks” and identified all of properties that were to be inspected in each block. The department then went out and completed the inspections; with the information obtained a history file was then created. Chief Knorr further stated, that once the Deputy Fire Marshals were properly trained and the inspection program was up and running, the process of inspecting all inspectable properties in

the Township took approximately 18 months to complete. According to Chief Knorr, as the years passed an increased workload was put on the office and when he retired in 2005, the inspection of all township buildings was taking over three years to complete. The inspection program that was created by Chief Knorr, with minor modifications is still used today and is a very effective tool. In addition, technology in the form of a proprietary inspection software program was implemented and used today to gather and retain our inspection data. Firehouse software is the database that is used and allows us to retain a complete history of all of our occupancies and also allows us to share our history file electronically with all of the fire companies in our department. Although this database has allowed us to keep better records, the continual updating and inputting of information is another area that adds to the overall workload of the FDO.

The issue that the FDO continues to face is that the overall workload continues to increase while staffing has not increased and recently was reduced. The inspection of all buildings in our township that once took eighteen months to complete is now taking approximately five years to complete. These results have been shared with the Township Manager and with the Board of Commissioners both verbally and through the department's annual report. In addition, this researcher has requested additional staffing has for several years and this request was further supported by documentation in the most recent fire services study conducted by Carroll Buracker and Associates, Inc. in 2007, only to be denied. The fire services study states "In a number of areas the workload continues to increase while, through the years, the staffing levels have declined." (Carroll Buracker & Associates, Inc, 2007, p. 342) The study further recommends that "the fire prevention function of the LMFDF should be provided adequate staff to manage the complex workload associated with effective fire prevention programs. The

creation of a fire prevention division and the addition of fire inspectors and administrative support should provide a good start to improving the code enforcement, plan review, and building inspection process.” (Carroll Buracker & Associates, Inc, p. 360)

With the current economic challenges facing the Township, the Township is currently looking for ways to reduce its overall costs. Personnel expenses are by far the largest part of the overall operating budget and one of the ways the Township Manager has looked to save monies, is through attrition and not filling any vacant positions of those who retire or leave employment with the Township. In the 2011 proposed budget the Township Manager proposed to eliminate seven full time positions. One of those was the Fire Departments Deputy Chief position, as he did not feel the position was needed or necessary. The Township Manager did however permit this researcher to lobby the Commissioners for their support of this position (D. S. Cleland, personal communication, October 22, 2010). Through lobbying, this researcher was able to convince a majority of the members of the Board of Commissioners that this position was a necessity, and therefore the position remained authorized, but as an unbudgeted, unfilled position.

The opinions and attitudes of the volunteers also have an impact on the activities of the Fire Department Office, due to the political nature of the volunteer fire service. There are a myriad of opinions regarding what the fire department office accomplishes and the need for career personnel in our office. In lobbying for this position, this researcher approached the volunteer Presidents and Chiefs to in order to ask for their support in retaining the Deputy Chief position, they were reluctant at first and requested that I meet with them to explain what this position did and the need for this position. This is mainly due to the individual fire companies traditionally not understanding the importance of fire prevention, since their personal beliefs are

based on a suppression mindset and not fire prevention. The most recent fire services study states, “Despite the existence of the Lower Merion Fire Department and their key role in that organization under Township Code, operationally, the fire companies appear to focus their service needs assessments, decision making and strategies for staffing, apparatus and equipment on their own first-due response area (Carroll Buracker & Associates, Inc, 2007, p. iv). The Township has twice hired outside consultants to advise us on the matter of fire prevention staffing and workload, and in both of these fire services studies additional manpower was recommended for the fire department office. This research paper attempts to review the Township’s fire service thoughts, past consultants studies, others research on the matter and current practices within the fire service.

The fire service in Lower Merion Township is continuing to evolve and with the lessening number of volunteer firefighters, it may become more imperative to have a strong fire inspection program in place. By having such a system, it would help to supplement the volunteer fire service and allow it to continue until such time that we do not have enough volunteers to fulfill our mission. This will be accomplished by mitigating the risk of fire through regular fire prevention inspections, plan review, public education and code enforcement activities. NFPA 1201, the Standard for Providing Fire and Emergency Services to the Public (NFPA 1201), is the standard “intended for the use and guidance of persons charged with providing emergency services to protect lives, property, critical infrastructure, and the environment from the effects of hazards (e.g., fire, medical emergency, hazardous materials, natural disaster, community infrastructure disruption).(National Fire Protection Association [NFPA], 2010, p. 12-5) This standard lays out the governing authorities responsibilities. In Lower Merion Township this is done through ordinance, under chapter 78 of the Township Municipal Code, also known as the

Fire Prevention Code. According to chapter four of NFPA 1720, the Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Volunteer Fire Departments, this standard speaks to community risk management and states that “the fire department shall participate in a process that develops a community fire and emergency medical services risk management plan. It further states that “the specific role of the fire department and other responding agencies shall be defined by the community risk management plan.” (National Fire Protection Association [NFPA], 2010, p. 1720-6)

The mission of the United States Fire Administration is to provide national leadership to foster a solid foundation for our fire and emergency services stakeholders in prevention, preparedness and response. Certainly prevention, preparedness and response are directly linked to the number and deployment of our personnel, specifically for the purposes of this paper, to determine the actual fire prevention workload in order to assure proper staffing levels in the Lower Merion Fire Department Office are adequate enough to provide a true and comprehensive fire prevention program that will mitigate and reduce community risk. While mitigating risk and protecting our communities sometimes cannot be prevented, the Executive Analysis of Community Risk Reduction course stresses the need to educate citizens and decision makers on the existing and potential risks of a community, in order that they will be better prepared to partner with the fire service in order to create the change needed to address our needs. This research will provide the fire service leader with the tools needed to present and justify needed staffing levels within an organization.

One of the goals of the United States Fire Administration is to reduce risk at the local level through prevention and mitigation by encouraging local adoption of risk reduction,

prevention, mitigation, and safety strategies. By developing plans through valid research techniques, the fire service will show that they are professionals when justifying their requests for proper staffing levels for the fire prevention division. An efficient fire prevention program that is carried out by trained personnel is the most cost effective method to reducing the loss of life and property from fire.

### LITERATURE REVIEW

A literature review was conducted for the purpose of reviewing how staffing is determined in other departments, as well as determine the proper number of personnel for the Lower Merion Fire Department. The review included researching different fire service journals such as Firehouse magazine, Fire Chief magazine, Fire Rescue magazine and Fire Engineering. This researcher also reviewed applied research papers from the National Fire Academy and books on fire service management. In addition to researching these journals, papers, and books, discussions and interviews were conducted with other Fire Chiefs, the Lower Merion Township Manager, the former Lower Merion Chief Fire Officer and others related to the fire service. A survey was developed and sent out to area Fire Chiefs, while a questionnaire was sent out nationwide using Survey Monkey in order to capture a broader perspective.

The first part of the literature review focused on the recommended standards that are currently being used by other fire departments for determining the work requirements for fire prevention inspectors in carrying out their mission. This researcher could find no national standards that exist, nor any state level requirements for fire prevention inspection requirements with the exception of a reference to the International Fire Code, which puts the responsibility of fire prevention on the local jurisdiction. This researcher did however review several books and journals regarding this topic. As stated there are recommended standards that the fire service

uses through the National Fire Protection Association (NFPA). In reviewing the NFPA Standards, NFPA 1201, recommends that “the Fire and Emergency Services Operation (FESO) shall carry out a program to develop public awareness and cooperation in the management of risk, based on analysis of relevant loss records and potential hazards in the identifiable physical and social sectors of the community.” (National Fire Protection Association [NFPA], 2010, p. 1201-5). Section 4.3.3 of this standard goes on to state that “the FESO shall develop programs under which regular examinations are performed in every part of the service area in which hazardous situations could develop and further outlines recommendations for master planning, the organizational structure, community planning, code administration, and public education” (NFPA, p. 1201-5). The book *Managing Fire and Rescue Services* states, “the fire service exists to protect people and their property from fires, and that remains the service’s core mission even as firefighters have learned new skills and taken on new responsibilities. Protecting against fires has three components: defining and addressing the problem, improving fire prevention, and suppressing fires when they do break out. (International City/County Management Association [ICMA], 2009, p. 16). Chapter 12 further describes the major parts of a comprehensive prevention program as being engineering, enforcement, education, and investigation. (ICMA)

This researcher also read in the book *Organizing for Fire and Rescue Services*, that “when the National Commission on Fire Prevention and Control published the results of its in-depth study on the fire problem in America, “In its report *America Burning*, the commission emphasized the necessity of increased fire prevention activities to reduce fire. It was the Commission’s position that increasing emphasis on fire prevention would measurably affect the U.S. fire loss picture. Statistics validate this position for areas in which fire prevention activities have been implemented. (Cote, 2003, p. 307).

This researcher then looked at different criteria currently being used in evaluating and determining the present fire prevention staff work level capability. Again as with the findings for the first part of this review, local ordinance, state requirements and the national fire protection standards are all things that should be reviewed in determining the criteria of the work levels of fire prevention staff. In researching the different criteria used, former Lower Merion Fire Department Chief Fire Officer Harry Knorr, Jr. felt that knowledge of the fire code and some knowledge of the layout of the township was a necessity. He also felt that you needed people with common sense, someone that could enforce the code and was firm in getting the job done while not alienating the customer, which is the businessman (H. R. Knorr, Jr., personal communication, January 27, 2011). Chief Knorr was interviewed due to his previous experience and history of the fire prevention program in the Township of Lower Merion.

NFPA 1201, Annex A, also provides different models that helped in analyzing the personnel needed in order to achieve the required levels of service that are to be provided to the community, as well as outlines the different components of a public fire and emergency service program. This researcher also spoke with Chief Fire Marshal John Waters of the Upper Merion Township Fire and Rescue Services who provided this researcher with an excel spreadsheet that determined the necessary staffing levels needed if his department were to go to a career department. Although this spreadsheet determined the necessary staffing levels for a career suppression unit, these positions could be substituted with the criteria and work requirements of fire prevention staff and would produce the same results. (J. Waters, personal communication, March 16, 2011)

According to Mr. Leslie Adams, the 2007 fire services study team consultants considered the following in determining the staff work level capabilities and suggested levels of the Fire

Department Office: the current NFPA fire protection handbook; CFAI fire prevention staffing-related provisions; the Townships casualty and fire loss data; applicable Commonwealth of Pennsylvania and Lower Merion Township fire prevention-related law; authority and responsibilities of the office; current organization and staffing; previous recommendations/requests to Township officials for future changes in organization and staffing--budget and other document submissions; expected future organization and staffing changes; workload and related trends in the areas of office work--- inspections, plan review, public education and investigations; current Township development; information provided related to future development; noted past trends related to workload increasing and staffing reduction/s; extent of involvement on the part of fire company staff in fire prevention activities; staff opinions and thoughts gathered during the interview process; previous experience of the study team related to previous fire prevention—related responsibilities; previous experience of the study team related to past fire prevention agencies assessed; fiscal condition of the Township and perceived “ability to pay” and reasonableness of various potential Office organization and staffing options (L. D. Adams, personal communication, March 16, 2011).

The report, *Measuring Code Compliance Effectiveness for Fire-Related Portions of Codes* states “Based on past fire audits and inspector observation, TriData estimates that a full-time inspector can conduct at least four to six inspections on average per day using manual reporting systems. This is an average of between 800 to 1,000 inspections per year. (The Fire Protection Research Foundation, 2008, p. 25) This research further gives examples of how to measure inspector workload. In addition NFPA 1201 also provides a process for analyzing workload.

This researcher then reviewed the job requirements of the Deputy Fire Marshals and broke down the different tasks of the current fire marshals and compared these to the data in firehouse software. These tasks include administrative duties, plan review, code consultations, preplanning, data input, fire alarm testing, faulty and false fire alarm follow up, supervising fire drills, tent inspections, blasting supervision, public education, fire incident response, apparatus pump testing, air testing, life safety field inspections and reinspections, and response to fires.

Lastly, the review looked at what fire prevention workload will not be accomplished under the present fire prevention staffing levels. Again as with the previous question, according to Mr. Leslie Adams (L. D. Adams, 2011) the decision of the study team to recommend additional staffing was based on their previous experience with the assessment of other fire prevention agencies and the fact that the FDO workload was increasing, furthermore current and past trends showed the need for additional staffing.

NFPA Standard -1201, recommends that the FESO shall carry out a program to develop public awareness and cooperation in the management of risk and further states that the FESO shall develop programs under which regular examinations are performed in every part of the service. The FESO shall also provide programs that prevent fires, injuries and death; mitigate fires, injuries, death, property damage, and environmental damage; recover from fires, emergencies, and disasters; protect critical infrastructure; sustain economic viability; and protect cultural resources (NFPA, 2010). In using the models outlined in NFPA 1201 and the TriData staffing model it became evident that it is not possible to provide all of the programs outlined in NFPA 1201 with our current staffing levels and therefore the backbone of our fire prevention efforts, public education and the building inspection program will continue to suffer.

In the book, *Organizing for Fire and Rescue Services*, it states that, “Inspections conducted as part of code enforcement help to ensure compliance with mandated life safety conditions within a structure.” It further states, inspections, which are intended to prevent fires from occurring, are effective because the inspector identifies fire hazards that could cause a fire, allow a fire to develop, or allow a fire to spread” (Cote, 2003, p. 313)

The information obtained in this literature review by researching other projects will be used as a basis for requesting additional fire prevention staffing in the Lower Merion Fire Department, as well as identify what will not be accomplished if additional staffing is not provided to supplement the current staffing levels.

## PROCEDURES

The procedures used in order to determine the need for additional staffing were to conduct a Literature Review at the Learning Resources Center (LRC) of the National Fire Academy (NFA) in Emmitsburg, Maryland. A keyword search was made using the on-line catalog at the LRC, using terms such as fire prevention, fire inspections, staffing, and workload requirements. In addition, keyword searches using these same terms was also performed on the internet by searching sights such as Google, Yahoo, and Bing. The National Fire Protection Association (NFPA) standards were reviewed using the Lower Merion Fire Department’s copy of these standards. A copy of the International Fire code was also reviewed using the Lower Merion Fire Department’s copy of this standard. Other procedures used were to develop surveys and questionnaires while also interviewing different persons with fire prevention responsibilities. In all, a total of sixty-two surveys and questionnaires were sent out with a total of twenty-three surveys being returned, or 37.1%. In addition, four separate personal interviews were conducted with representatives from the fire service and outside of the fire service.

The first survey that was developed (See Appendix A) was sent out by email with an introductory letter to the Chiefs of several Fire Departments located in Montgomery County, Pennsylvania. This survey was sent out by email in order to receive feedback from fire departments that serve similar demographics as those of Lower Merion. Twenty-two surveys were sent out to the local area Fire Companies and Fire Departments that are located in Montgomery County, with nine surveys being returned or 40.9%.

A questionnaire was also developed (See Appendix B) and sent out with an introductory letter nationwide to Fire Officers this researcher met at the National Fire Academy while attending different courses there. This questionnaire was sent out using the internet based survey tool called Survey Monkey. This questionnaire was developed in order to reach out and receive feedback from a broader audience in order to learn how fire prevention staffing and workload were established. A total of forty questionnaires were sent out nationally, with a return of twelve or 30%.

In preparing the surveys and questionnaires, the use of blank fields were used in order to give the respondents the ability to fill in any other non-listed choices or to add comments in order to make components of the survey non-exhaustive. This however leads to a margin of user error, which was indicative by some of the comments that were left by the respondents. Other limitations were that not all of the fields were filled out by all of the respondents, leaving an unequal ratio to compare answers. One survey was not able to be identified as either being from the local group or the national group.

In addition, this researcher offered the opportunity for all of the respondents to receive a copy of the final results if they so desired. This was done in hope that this would encourage more participation from those being surveyed and questioned.

Interviews were conducted with former Lower Merion Fire Department Chief Fire Officer Harry Knorr, Jr., Chief Fire Marshal John Waters of the Upper Merion Township Fire and Rescue Services and the Township Manager Douglas Cleland of Lower Merion Township. The lead for the 2007 Study Team from Carroll Buracker and Associates, Inc., Mr. Leslie D. Adams, was also questioned on how they determined the proposed staffing levels in their recommended findings.

Chief Knorr was interviewed due to his experience in putting together the original fire inspection program, as well as his experience in the Fire Marshal's Office as an Assistant Chief with the Philadelphia Fire Department and as the former Chief of the Lower Merion Fire Department. This interview took place on November 24, 2009 over the telephone. The questions asked of Chief Knorr were: a) were your main concerns when taking over the Lower Merion Fire Department in regards to fire prevention; b) what criteria did you use in determining the work requirements of your staff; c) what did you feel the work level capability was of the entire staff; d) when you retired, was there any kind of work load that was not being accomplished due to staffing levels?

Chief Waters was interviewed via telephone on March 8, 2011 due to his expertise as a Fire Chief of a similar department who is also in charge of code enforcement. The questions asked of Chief Waters were: a) what criteria do you use in determining the work requirements of your staff; b) how do you determine the work level capability of your staff?

Mr. Adams was interviewed due to his previous experience and as a consultant that studied the Lower Merion Fire Department. The interview was conducted by electronic means. The questions asked of Mr. Adams were: a) how did you determine the needed staffing levels of

the Lower Merion Fire Department Office; b) what references were used in making your determination?

Lastly this researcher conducted a group interview with the Lower Merion Fire Department Deputy Fire Marshals. This interview took place on March 16, 2011 in my office at the Lower Merion Township Municipal building. The questions asked of the Deputy Fire Marshals: a) do you agree with the final numbers for each category on the activity reports for each of you; b) do you agree with the final inspection numbers on the inspector reports for each of you; c) do you agree with the number of fire responses for each of you for 2010; d) what do you feel is a good estimate of hours and explain your reasoning for this for the uncertainty factor to be used in the NFPA 1201 model? A limitation identified while interviewing the fire marshals was that not all of them had entered all of their respective data into the firehouse software database in regards to the activities measured, therefore estimations had to be used based upon the data that was available.

## RESULTS

Responses were received back from each of the two groups surveyed and questioned. In addition to researching the following questions, this researcher also asked for each of those surveyed to include their demographics and size of their department in order to try and make a comparative analysis between the respondent and Lower Merion Township. In all, a total of sixty-two surveys and questionnaires were sent out with a total of twenty-three surveys being returned, or 37.1%. In addition, three separate personal interviews and two personal communications were conducted with representatives from the fire service and outside of the fire service. Overall the surveys that were returned and the interviews conducted, helped in determining answers to the research questions listed below.

1) What are the work requirements for fire prevention inspectors?

This researcher could find no national requirements that exist, nor any state level requirements for fire prevention inspection requirements, with the exception of a reference to the International Fire Code which puts the responsibility of fire prevention on the local jurisdiction. This researcher did find that under the Uniform Construction Code there are several certifications and found a certification for fire inspector, however this certification is not recognized in the Commonwealth of Pennsylvania.

Although not requirements, this researcher was able to find recommended standards for fire and emergency service organizations. In reviewing the NFPA Standards, NFPA 1201, recommends that “the Fire and Emergency Services Operation (FESO) shall carry out a program to develop public awareness and cooperation in management of risk, based on analysis of relevant loss records and potential hazards in the identifiable physical and social sectors of the community.” (National Fire Protection Association [NFPA], 2010, p. 1201-5). Section 4.3.3 of this standard goes on to state that “the FESO shall develop programs under which regular examinations are performed in every part of the service area in which hazardous situations could develop and further outlines recommendations for master planning, the organizational structure, community planning, code administration, and public education” (NFPA, p. 1201-5). Chapter four of NFPA 1720, the Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Volunteer Fire Departments, this standard speaks to community risk management and states that “the fire department shall participate in a process that develops a community fire and emergency medical services risk management plan. It further states that “the specific role of the fire department and

other responding agencies shall be defined by the community risk management plan.” (National Fire Protection Association [NFPA], 2010, p. 1720-6)

This researcher also found NFPA performance standards that identify minimum job performance requirements that outline professional qualifications for certain positions in the fire service. NFPA 1037, the Standard for Professional Qualifications for Fire Marshal outlines requisite knowledge that Fire Marshals should be expected to meet in the performance of their duties, “specifically identifying the minimum job performance requirements necessary to perform as a fire marshal.” (National Fire Protection Association [NFPA], 2007, p. 1037-5) In addition, NFPA 1031 outlines the “minimum job performance requirements for service as a fire inspector and plan examiner.” (National Fire Protection Association [NFPA], 2009, p. 1031-5)

From the interviews and the answers received in the surveys and questionnaires, this researcher was able to determine that at a minimum fire prevention departments performed life safety inspections, public education, and fire investigations, however a majority of those surveyed also performed plan reviews and new construction inspections. A further review found that many of those surveyed locally, also had firefighter training as part of their work requirement while only one of those surveyed nationally had that as a requirement.

Another interesting finding was that almost all of those surveyed and questioned were using some type of technology in the form of a proprietary or in-house developed computer program to perform their inspections and track workload.

From the interviews conducted with Chief Knorr and Chief Waters, both agreed that due to the type of fire service in this geographical area, life safety inspections, plan review, public education, and enforcement of the fire codes are major components in the success of any fire service.

A further review found in *Managing Fire and Rescue Services* states, “the fire service exists to protect people and their property from fires, and that remains the service’s core mission even as firefighters have learned new skills and taken on new responsibilities. Protecting against fires has three components: defining and addressing the problem, improving fire prevention, and suppressing fires when they do break out. (International City/County Management Association [ICMA], 2009, p. 16). Chapter 12 further describes the major parts of a comprehensive prevention program as being engineering, enforcement, education, and investigation. (ICMA) “In its report *America Burning*, the commission emphasized the necessity of increased fire prevention activities to reduce fire. It was the Commission’s position that increasing emphasis on fire prevention would measurably affect the U.S. fire loss picture. Statistics validate this position for areas in which fire prevention activities have been implemented. (Cote, 2003, p. 307).

In order to further help answer this question, a total of 62 surveys (See Appendix A) and questionnaires (See Appendix B) were sent out with a total of 23 surveys being returned or 37.1%. This is further broken down into 22 surveys were sent out to local Fire Departments that are located in Montgomery County, with 9 surveys being returned, or 40.9%. Another 40 questionnaires were sent out nationally to colleagues this researcher met while attend the national Fire Academy, with a return of 12, or 30%.

<b>LOCAL SURVEY - FIRE PREVENTION STAFFING AND WORKLOAD</b>		
<b>Size of Department</b>	<b>Fire Prevention Staff</b>	<b>Population Served</b>
Not Answered	4 FT	19,000
2.5 career, 150 volunteers	1.5	21,000
18 Career	1	30,000
5 career, 40 volunteers	0	25,000
Not Answered	1	25,000
50	5	7,900
1.5	1.5	16,045
2 career, 150 volunteers	2	41,000
235	4	56,500

5	2	18,000
<b>Total Budget</b>	<b>Fire Prevention Budget</b>	<b>Fire Prevention Responsibilities</b>
\$600,000	\$20,000	LSI, PE, FI, FFT
\$670,000	\$200,000	PR, LSI, NCI, PE, FI, FFT
\$2,272,007	\$3,057	PR, LSI, NCI, PE, FI, FFT
\$780,000	\$7,000	PR, LSI, NCI, PE, FI, FFT
No Response	No Response	PR, LSI, NCI, PE, FI
\$440,000	\$5,000	PR, LSI, NCI, PE, FI, FFT
\$1,412,123	\$120,315	LSI, PE, FI
\$265,000	\$1,500	PR, LSI, NCI, PE, FI
\$2,002,000	\$363,360	PR, LSI, NCI, PE, FI
\$580,000	\$50,000	PR, LSI, NCI, PE, FI, FFT
<b>Number of Properties</b>	<b>Properties Inspected Annually</b>	<b>Inspection Fee</b>
Not Answered	305 + 277 reinspections	No
650	350	Yes
378	378	Yes
500	300	Yes
120	Not Answered	No
4,200	4,200	No
Not Answered	75 to 100	No
224	224	No
1,000	Not Answered	Yes
2900	2500	Yes
<b>Technology used</b>	<b>Workload Quantification</b>	<b>Workload Administrative Time</b>
Proprietary inspection software program	Yes	Yes
Proprietary inspection software program	No	Sometimes
Proprietary inspection software program	Yes	Yes
Paper, Pencil and Calculator and Software program	Yes	Yes
Proprietary inspection software program	No	Sometimes
Proprietary inspection software program	Yes	Yes
Proprietary inspection software program	No	No
In-house developed computer program	Yes	No
Proprietary inspection software program	Yes	Yes
Proprietary inspection software program	Yes	Yes

Unknown if this is a local or national survey

**Fire Prevention Responsibilities** - PR = Plan Review, LSI = Life Safety Inspection, NCI = New Construction Inspection, PE = Public Education, FI = Fire Investigation, FFT = Firefighter Training

<b>NATIONAL SURVEY - FIRE PREVENTION STAFFING AND WORKLOAD</b>		
<b>Size of Department</b>	<b>Fire Prevention Staff</b>	<b>Population Served</b>
19 career, 20 volunteer	0	25,000

Not Answered	0	15,000
22 FT, 30 PT	1	35,000
125	4	85,000
97.5	4 FT, 5 PT	58,720
Not Answered	Not Answered	67,000
141	6	43,000
Not Answered	2 FT, 2 PT	247,000
215	11	40,000
60	Not Answered	90,000
524	15 FI, 15 FP with 448 FF's assisting	210,000
48	1	35,000
<b>Total Budget</b>	<b>Fire Prevention Budget</b>	<b>Fire Prevention Responsibilities</b>
\$6,000,000	\$25,000	PE, FFT
\$450	\$0	None
\$3,030,000	\$100,000	PR, LSI, NCI, PE, FI
\$1,700,000	Not Answered	PR, LSI, NCI, PE, FI
\$16,683,778	\$678,149	PR, LSI, NCI, PE, FI
\$16,000,000	\$658,000	PR, LSI, NCI, PE, FI
\$25,000,000	Not Answered	PR, LSI, NCI, PE, FI, FFT
\$13,250,589	Unknown	PR, LSI, NCI, PE, FFT
\$26,000,000	\$2,000,000	LSI, PE, FI
\$14,000,000	Not Answered	PR, LSI, NCI, PE, FI
\$42,000,000	\$2,100,000	PR, LSI, PE, FI, FFI
\$4,300,000	\$10,000	PR, NCI, FI
<b>Number of Properties</b>	<b>Properties Inspected Annually</b>	<b>Inspection Fee</b>
0	0	Not Applicable
497	0 - Contracted out	No
200 - 250	Not Answered	No
Unknown	120	No
Unknown	3,202	No
2,600	2,600	No
4,600	Not Answered	Yes
Unknown	Unknown	No
6,000	Not Answered	Yes
2,500	500	Yes
10,180	10,180	No
2,500	Unknown	No
<b>Technology used</b>	<b>Workload Quantification</b>	<b>Workload Administrative Time</b>
Not Applicable	Not Applicable	Not Applicable
Not Applicable	Yes	Yes
Proprietary inspection software program	No	Sometimes
Paper, Pencil, and Calculator	Yes	Sometimes
Proprietary inspection software program	Yes	Yes
Paper, Pencil and Calculator and Proprietary Software	No	Yes
Proprietary inspection software program	Yes	Sometimes
Paper, Pencil and Calculator and In-house Software	No	Sometimes
Paper, Pencil and Calculator and Proprietary Software	Yes	Yes

Proprietary inspection software program	Yes	Yes
Proprietary inspection software program	Yes	Yes
Proprietary inspection software program	No	No

**Fire Prevention Responsibilities** - PR = Plan Review, LSI = Life Safety Inspection, NCI = New Construction Inspection, PE = Public Education, FI = Fire Investigation, FFT = Firefighter Training

2) What is the present fire prevention staff work level capability?

This researcher found that local ordinance, state requirements and the National Fire Protection Associations standards are all things that should be reviewed in determining the criteria of the work levels of fire prevention staff. In researching the different criteria used, former Lower Merion Fire Department Chief Fire Officer Harry Knorr, Jr. felt that knowledge of the fire code and some knowledge of the layout of the township was a necessity. (H. R. Knorr, Jr., personal communication, January 27, 2011).

NFPA 1201, Annex A, provides different models that help in analyzing the personnel needed in order to achieve the required levels of service that are to be provided to the community, as well as outlines the different components of a public fire and emergency service program. (See Appendix C)

The report, Measuring Code Compliance Effectiveness for Fire-Related Portions of Codes states “Based on past fire audits and inspector observation, TriData estimates that a full-time inspector can conduct at least four to six inspections on average per day using manual reporting systems and provides a model to measure inspector workload.” (TriData 2007) (The Fire Protection Research Foundation, 2008, p. 7) (See Appendix D)

This researcher also spoke with Chief Fire Marshal John Waters of the Upper Merion Township Fire and Rescue Services who provided this researcher with an excel spreadsheet that determined the necessary staffing levels for his department should it go to a career department. (See Appendix E) Although this spreadsheet determined the necessary staffing levels for a

career suppression unit, these positions could be substituted with the criteria and work requirements of fire prevention staff and would produce the same results (J. Waters, personal communication, March 16, 2011).

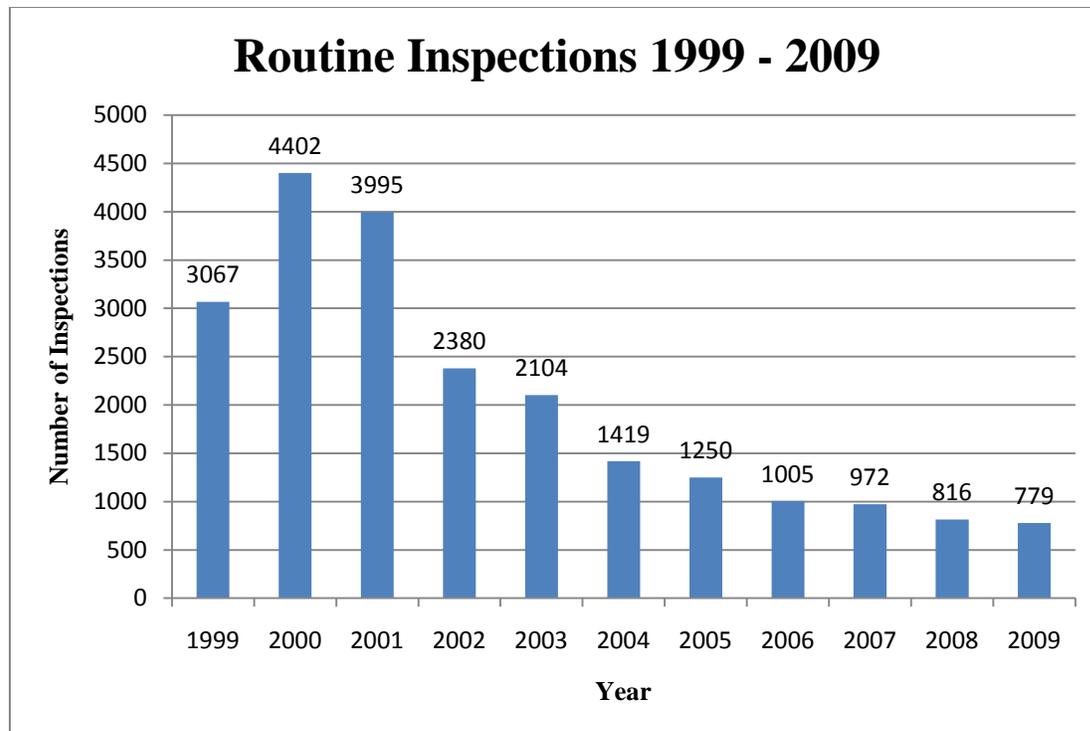
Mr. Leslie Adams, the 2007 fire services study team lead consultant was also contacted to see what criteria they used in determining the workload and suggested levels of staffing in the Fire Department Office. According to Mr. Adams, the following was used in making their determination: the current NFPA fire protection handbook; CFAI fire prevention staffing-related provisions; the Townships casualty and fire loss data; applicable Commonwealth of Pennsylvania and Lower Merion Township fire prevention-related law; authority and responsibilities of the office; current organization and staffing; previous recommendations/requests to Township officials for future changes in organization and staffing--budget and other document submissions; expected future organization and staffing changes; workload and related trends in the areas of office work--- inspections, plan review, public education and investigations; current Township development; information provided related to future development; noted past trends related to workload increasing and staffing reduction/s; extent of involvement on the part of fire company staff in fire prevention activities; staff opinions and thoughts gathered during the interview process; previous experience of the study team related to previous fire prevention—related responsibilities; previous experience of the study team related to past fire prevention agencies assessed; fiscal condition of the Township and perceived “ability to pay” and reasonableness of various potential Office organization and staffing options (L. D. Adams, personal communication, March 16, 2011).

In order to get data to use in both the NFPA 1201 and TriData measuring guidelines, this researcher ran staff activity reports using the department’s firehouse software database, as well

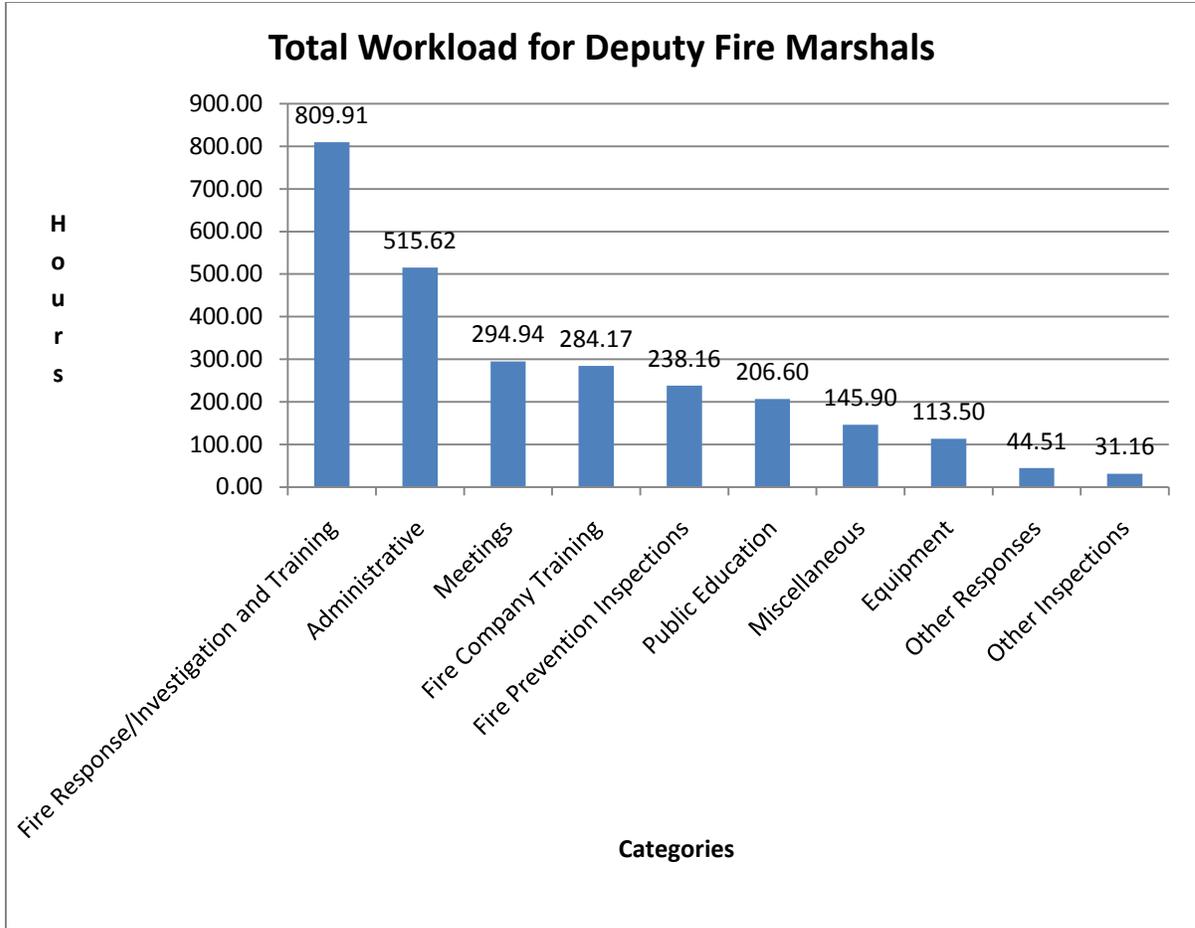
as received reports from the Township's Human Resources' department. The information provided from these reports was used to answer those specific areas that were asked for in these measuring guidelines. This researcher then interviewed the Deputy Fire Marshals in regards to the current workload identified from these measuring guidelines. (F. P. Hand, M. M. Maguire, & J. P. McCoy, personal communication, March 16, 2011) It was determined that the Deputy Fire Marshals workload capabilities are at a maximum and therefore parts of those categories identified will suffer, in particular life safety inspections. This is proven in the inspection category as inspections in Lower Merion Township have been on a steady decline since 2001 and are expected to hit an all time low in 2010, due to the staffing decline and additional workload of the department.

- 3) What fire prevention workload will not be accomplished under present fire prevention staffing levels?

The chart below shows that the inspection program has been decreasing annually since 2001. It is again expected to take a significant drop in 2010, due to the loss of the Deputy Chief position, as the duties of this position have been distributed and/or shared amongst the Deputy Fire Marshals. This is due to the current workload of the Deputy Fire Marshals and additional duties that have been added to their plate.



This researcher then looked at the current workload of the Deputy Fire Marshals and in using the firehouse software database was able to break this down into ten specific categories. Within each of these categories there were specific tasks associated with it. (See Appendix F) The categories identified were fire prevention inspections, public education, fire company training, equipment testing and inspection, fire response/investigation and individual training, administrative duties, meetings, other inspections, other responses, and miscellaneous. The chart below shows the total number of combined hours of each of the fire marshals spent in each of these categories.



In reviewing this data and using both the NFPA 1201 measuring guideline and the TriData measuring guideline, the number of hours of total demand (6,960) is higher than the total available hours (4,356), therefore one or more categories are going to decline. Since 2001 it has been in the area of inspections. Inspections will continue to be an area in decline as well as training and public education. Lastly, there will continue to be no one available to research grants which could provide overall savings to the Township.

### DISCUSSION

The primary mission of the fire service as a whole has always been to protect lives and property, and although that will not change, what has changed is how the fire service deploys and operates in order to fulfill its multifaceted mission. The fire service as we know it today

however is a relatively new profession. Since its inception the fire service has evolved considerably, and we can only assume that the future will bring additional changes and advances in not only the fire service but in our society as a whole. Knowing this, the fire service must become aware and willing to accept these changes and advances, while also remaining a proactive force in eliminating risk in our communities.

Another area of major change that must be seriously considered in the Lower Merion Fire Department is the decline in the number of volunteer firefighters. "The Commonwealth of Pennsylvania in 1976 had 300,000 volunteers, in 2003 this number was down to 72,000 today" (Legislative Budget and Finance Committee, 2005, p. S-6), in 2009 it was estimated to be down to 50,000 volunteers. This reduction in numbers is due to the time commitment needed today in order to become a firefighter. It is also due to the inability of people to take time away from work for training and to respond to emergencies. Many of today's volunteers do not work in the neighborhoods they serve, we have two income families so there is less time to give to the time demands associated with training; responding to incidents, maintaining the fire houses, fire apparatus, and their equipment; fundraising efforts; and the administration of a non-profit corporation. This has had a negative effect on the volunteer fire service and today's fire service is witnessing the consolidation of volunteer fire departments across the Commonwealth, as increasing costs coupled with a decreasing number of volunteers have forced many fire companies to work together in order to survive. This is important to consider because with less fire companies and a lessening number of volunteers, a comprehensive fire prevention plan is paramount and will help in the reduction of fires and mitigation of risk in our communities, therefore helping to sustaining our volunteer fire service.

Local governments are also being forced to find ways to cut costs and this is no different in the Township of Lower Merion. One of those areas that is constantly being reviewed is with staffing, with the current economic downturn a decision was made by the Township Manager not to fill any vacant positions in the Township, in order to realize budgetary savings and help lower the deficit. Most recently in the 2011 proposed budget, the Township Manager proposed to eliminate seven full time positions. One of those positions was the Fire Departments Deputy Chief position, as he did not feel the position was needed or necessary. Through lobbying, this researcher was able to convince a majority of the members of the Board of Commissioners that this position was a necessity, and therefore the position remained authorized, but as an unbudgeted, unfilled position.

In 2007, a complete study was conducted by Carroll Buracker and Associates, Inc and one of the areas studied was fire prevention. The study team said the following in their report. “The Study Team’s review of LMFD’s fire prevention functions shows that there has been much discussion over time about the fire prevention needs of the community and how the LMFD is to meet those needs. Certainly land development and economic growth have affected these needs, and it appears that the department has struggled at times to meet these demands placed on it” (Carroll Buracker & Associates, Inc, 2007, p. 336) The study further states, “It is through an effective life and fire safety education, investigation, code administration, application and enforcement effort that a municipality will realize the greatest protection from fire and accident. No number of firefighters, fire/rescue houses, apparatus and/or equipment can save lives or property from fire as well as an educated public.” (Carroll Buracker & Associates, Inc, p. 359) In the recommendations section of this study, it recommended that “the fire prevention function of the LMFD should be provided adequate staff to manage the complex workload associated

with effective fire prevention programs.”(Carroll Buracker & Associates, Inc, p. 360) In summary, the 2007 study recommended creating a fire prevention division that would be headed by a current Deputy Fire Marshal and re-titling the other two, to Assistant Fire Marshal. In addition the study recommended adding two fire inspectors and an administrative secretary in order to handle the current workload of the department at that time.

In 1990, a previous study of the department was conducted by Burkell and Associates with similar results. This study again recommended creating a Fire Prevention section and creating two additional fire inspector position within this section. (Burkell & Associates, 1990)

In *Managing Fire and Rescue services* this researcher read, “It is obvious to most people that preventing a problem is much more cost-effective than dealing with it after the fact, but few prevention efforts receive the resources and support they need if they are to be effective.” (ICMA, 2009, p. 357)

In the report, *Measuring Code Compliance Effectiveness for Fire-Related Portions of Codes*, it reads that “The Department, State, or municipality can be held accountable when a fire occurs as a result of conditions that would have been alleviated with the appropriate inspection practices, failure to inspect, failure to seek correction for non-compliance, or failure to re-inspect.” (The Fire Protection Research Foundation, 2008, p. 34)

In researching this topic it was discovered that in 1983 this office collected the information to identify all of the inspectable properties in Lower Merion Township. After the identification process we created inspection areas, which are called “blocks”. There are 65 blocks containing over 2300 properties. Some blocks are small geographically but contain many inspections because of density; others are larger with fewer properties. The block system allows us to keep a close watch on what is being inspected.

Over the years the number of inspections has been on a steady decline, this is due to many reasons as there has been an increase in fire calls that take away from inspection time, firehouse building renovation projects and other township building projects, attendance at land development for the many commercial and residential projects going on throughout the township, inspections of these new builds and renovations, the extra time it took to implement the new firehouse software program and to continually input information to keep it current, as well as additional requests from the public for training.

It was also identified that in the late 1990's, there was a position of Fire Inspector. In addition to this inspector performing inspections and re-inspections, the FDO also added a program of doing follow up telephone calls on all faulty and accidental fire alarm calls. In addition, the inspector was also able to check on the certification of fire sprinklers and develop some pre planning of major buildings. When this position was not replaced after his retirement, our number of completed inspections began to drop, the follow up to false fire alarms stopped which caused an added increase in needless responses, and the sprinkler certification program was changed from a site visit to a telephone call. Lastly preplanning was turned over to the individual fire companies and are no longer developed in the Fire Department Office.

From the interviews and the answers received in the surveys and questionnaires, this researcher was able to determine that at a minimum fire prevention departments performed life safety inspections, public education, and fire investigations, however a majority of those surveyed also performed plan reviews and new construction inspections. A further review found that many of those surveyed locally, also had firefighter training as part of their work requirement while only one of those surveyed nationally had that as a requirement. Mostly all of those surveyed and questioned were also using some type of technology in the form of a

proprietary or in-house developed computer program to perform their inspections and track workload.

In further studying the NFPA 1201 and TriData workload measuring guidelines, and then comparing the findings, this researcher was able to determine that the current staffing levels of the FDO is inadequate for the workload that was measured. According to the findings of the NFPA 1201 guideline the fire department office should have five positions dedicated to fire prevention activities. The TriData guideline shows that at a minimum each inspector should have 208 inspections ( $x 3 = 624$ ) and a high of 312 inspections ( $x 3 = 936$ ). We must also keep in mind that the data used was not complete in that it was discovered that not all of the Deputy Fire Marshals are properly inputting their duties in to the software database. This also represents an area of workload that was not accomplished and will continue to be an issue due to current staffing levels.

It is this researcher's opinion that we should have a minimum staffing level that includes a Chief, a Deputy Chief, three Deputy Fire Marshals, two Fire Inspectors and an Administrative Secretary, due to the current work demand of the Fire Department Office and future plans that are currently being discussed in the land development process of the Township, which will only add to the current workload of the FDO.

The current staffing levels of the FDO are inadequate for the size of our municipality and the questionnaire and survey sent out supports this fact as do the studies that were previously conducted of the Lower Merion Fire Department. The township needs to take a more serious role in the evaluation of the fire prevention needs of the fire department office and realize that the fire service is not only suppression force.

Another area that could be evaluated is in making the fire company employees, township employees, since the Township is using taxpayer monies to supplement the fire companies in order to pay them. These employees could then be used to do fire inspections which would allow us to inspect all of our commercial occupancies annually while also creating an immediate response to the community for fire related calls. This researcher does believe that this is something that would be seriously contested by the volunteer fire companies as one of the issues we still face in Lower Merion Township, is that the fire companies remain very parochial and there is an “us versus them” attitude when it comes to the relationship between the fire companies and the township. There is not a true team effort when it comes to fire prevention in Lower Merion Township, instead fire prevention is thought of by many as a once a week annual commitment, instead of a fifty-two week commitment.

#### RECOMMENDATIONS

Based upon the research conducted, the Township of Lower Merion should immediately fill the Deputy Chief position. By filling this position it would allow the Township to continue to investigate and implement a fee for service program. This program would then generate enough funding to support the hiring of two fire inspectors. The Township should also make it mandatory for all Fire Department staff to input their daily routines and inspections into the firehouse software database in order that accurate workload information may be obtained when needed.

Another area that should be evaluated is in the hiring of the fire company employees as township employees, therefore discontinuing the current practice of giving taxpayer monies to the fire companies to supplement the fire companies’ payroll. Instead these monies would be used by the Township to hire these employees, who then could be utilized more efficiently by

performing fire inspections and creating less downtime on their part, which would allow us to inspect all of our inspectable properties annually while also creating an immediate response to the community for fire related calls.

The township needs to take a more serious role in the evaluation of the fire prevention needs of the fire department office and realize that the fire service is not only a suppression organization. The Township must truly understand and commit to a fully comprehensive fire prevention program in order to mitigate risk and protect those we serve.

This research project therefore concludes, and this researcher recommends to the Township Board of Commissioners and the Township Manager that at a minimum provide additional fire prevention staffing in the Lower Merion Fire Department, in order to provide a true comprehensive fire prevention program for its citizens in order to mitigate unnecessary risk.

(See Appendix G)

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## APPENDIX A

### National Questionnaire

1. What is the Name and size of your Department? How many are dedicated to Fire Prevention activities?
2. What is the size of the population you serve?
3. What is the total budget of your department and how much is dedicated to Fire Prevention activities?
4. Which of these categories are the responsibility of your fire prevention department?
5. What is the total number of properties you inspect? How many properties do you inspect annually?
6. Do you charge for Inspections? If so, describe your fee structure or email separately to [cmcgarvey@lowermerion.org](mailto:cmcgarvey@lowermerion.org).
7. What technology do you use for tracking fire inspection activities and workload?
8. Do you feel that counting similar activities (i.e. inspections, education, investigations, plan reviews) accurately quantifies a fire prevention office workload?
9. Do you include time for paperwork and data entry when considering your fire prevention staff's workload?
10. Do you have any additional information you would like to add?

## APPENDIX B

### Local Survey

1. What is the Name and size of your Department? How many are dedicated to Fire Prevention activities?
2. What is the size of the population you serve?
3. What is the total budget of your department and how much is dedicated to Fire Prevention activities?
4. Which of these categories are the responsibility of your fire prevention department?
5. What is the total number of properties you inspect? How many properties do you inspect annually?
6. Do you charge for Inspections? If so, describe your fee structure or email separately to [cmcgarvey@lowermerion.org](mailto:cmcgarvey@lowermerion.org).
7. What technology do you use for tracking fire inspection activities and workload?
8. Do you feel that counting similar activities (i.e. inspections, education, investigations, plan reviews) accurately quantifies a fire preventions office workload?
9. Do you include time for paperwork and data entry when considering your fire prevention staff's workload?
10. Do you have any additional information you would like to add?

## APPENDIX C

NFPA 1201 Measuring Guideline

Components of a Public Fire and Emergency Service Program	Individual
Annual Hours at 100% availability	1950.00
Less annual leave and holidays	270.00
Less estimated sick leave	37.50
Less annual training	150.00
Personnel hours subtotal (hours per year per person)	1492.50
Times uncertainty factor	40.50
Total available hours (hours per year per person)	1452.00
Total demand hours ÷ Adjustment factor = Personnel positions	4.80

$$TD = 6960 \text{ divided by } 1452 = 4.80$$

## APPENDIX D

TriData Measuring Guideline

INSPECTOR WORKLOAD	
Multiply the Number of days in a week	5
By the Number of weeks in a year	52
Equals the Total Workable Days	260
Subtract Vacation, Holidays, Training, Sick	61
Equals	199
Subtract Other Activities	147
Equals the Total Available Inspection Days	52
Multiply by Low Number of Inspections	4
Equals Total Low Inspections	208
Multiply by High Number of Inspections	6
Equals Total High Inspections	312

APPENDIX E

Upper Merion Township Staffing Model

*Upper Merion Fire  
Department  
A Study in going Career*

Area Protected: 16.8 square miles  
 Population Protected: 26,000-night 200,000-day  
 Number of Stations: 4  
 ISO Fireflow: 3500 gpm  
 ISO Classification: 5

Apparatus/Staffing Requirements:		Drivers	Lieutenants	Captains	Firefighters	Totals
per shift	4 engines	4	4		8	16
	2 ladders heavy	2		2	4	8
	1 rescue	1				1
	1 MVU shift	1				1
	1 commander	1				1
		9	4	2	12	27

per shift

**Personnel Requirements:**

Assuming a 48 hour workweek (2496-hour work year), and allowing 34 leave days per year (408 leave hours per year), the effective work week is 40.17 hours. Given 168 hours in a week, each position must be filled by 4.18 persons. This results in the following number of shift employees:

Line Staff:	Drivers	Lieutenants	Captains	Firefighters	Shift Commanders	Total Shift
	38	17	8	50	4	117
Administrative Staff:	Chief	Secretary				Total Dept.
	1	1				119

Salary Calculations:

Title	Positions	Salary	Total
Firefighters	50	\$ 47,000	\$ 2,357,520
Drivers	38	\$ 51,700	\$ 1,944,954
Lieutenants	17	\$ 56,870	\$ 950,866
Captains	8	\$ 62,557	\$ 522,977

Deputies	4	\$ 68,813	\$ 275,251
Secretary	1	\$ 28,100	\$ 28,100
Chief	1	\$ 88,800	\$ 88,800

**Total Salaries: \$ 6,168,468**  
**Benefits (33% of salaries): \$ 2,035,594**  
**Operating Expenditures: \$ 689,720**  
**Capital Expenditures: \$ 220,000**  
***Total Fire Department Budget: \$ 9,113,782***

**\$8,204,062**

## APPENDIX F

Workload Categories

Meetings	FP Inspections
Departmental Meetings	Alarm Follow Up
Building Department Meetings	Alarm Response Follow Up
CD & SP Meeting	Alarm System Testing
Emergency Management Team Meeting	Blasting Supervision
Emergency Operations Planning	Fire Code Consultations
Emergency Operations Training	Code Violations
Incident Support Team Meeting	Fire Marshal Sign Enforcement
Instructor Meeting	Fireworks Display Inspection
Land Development Meeting	Home Inspections
MCMFOA Meeting	Routine Inspections
Presidents and Chiefs meeting	Inspection Follow Up
Project or Construction Meetings	Plan Examination
LMPD Meeting	Smoke Detector Install
Recruitment and Retention	
SWAB - PA fire & Emergency Services Institute	
Training Committee	
I76/476 Task Force Meeting	
Township Board of Commissioners Meeting	
Township Employee Meeting ERA	
Township Safety Committee	

Education	Fire Companies Training
Career Day Education	Drill
Community Event	Fire Company Service
Bullex Fire Extinguisher Training	Mail delivery to fire stations
Fire Prevention Class (Community Groups)	Supervised Burn Drill
Fire Prevention Class (Elementary schools)	Supervised Fire Drill
Fire Prevention Class (Pre schools)	Supervised House/Building Drill
In-service Fire Safety Faculty Training - Medical	Supervised Rescue Drill
In-service Fire Safety Faculty Training - Daycare	Supervised Station Drill
In-service Fire Safety Faculty Training - Elem. Schools	
Fire Prevention Trailer	
Public Education	

Miscellaneous	Administrative
Funeral Detail	Data Entry
Miscellaneous Activities	Fire Code Research
Annual Physical	Fire Code Request
Parade/Ceremony	Fire Report Request
Ride along	Office Activities
Special Detail	Report Entry
Township Event	File Searches
Work Detail	

Equipment	Fire Response and Training
Air Testing - compressor unit	Fire School/Training
Communications	Fires at scene
Equipment Testing	Investigation/Operation by fire department
Fire Extinguisher Annual Inspection	In-service training, public safety officials
Fill Air Cascade	Township Training
Ladder Testing	Medical At scene
Tower Repair and Maintenance	

Other Inspections	Other Responses
AED Inspections	Assist Police
Car Seat Inspections	Citizen Complaint Follow-Up
Tent Inspection	
Underground Tank Inspection	

APPENDIX G

Recommended Organizational Chart

