Running head: ADAPTING TO MEET THE CHALLENGES FOR FIRE DEPARTMENT

Adapting to meet the challenges for fire department staffing at the Endicott, NY fire department.

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CERTIFICATION STATEMENT

I hereby certify that 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.

Signed: _____

Abstract

The Endicott Fire Department (EFD) has lost one third of its uniformed personnel due to fiscal instability of the municipality. The problem is that these negative impacts to staffing levels have compromised the delivery of fire and rescue services, placing the municipality at increased risk for firefighter injury, property loss and life loss. The purpose of the research was to construct a sustainable staffing plan within the financial constraints placed on the department by the municipality. Action research was utilized to answer the following questions. How have financial and cost issues affected fire department staffing? How does the organization's current staffing model compare to other fire service agencies with similar demographics? What staffing models are available that can provide adequate service levels? What are the advantages and disadvantages to the identified models? What challenges would the department face in adopting the newly constructed staffing plan?

The research compiled through a comprehensive literature review, questionnaire, fire department census data and personal interviews assisted in the creation of a new staffing model. The adoption of the new staffing model by the EFD will move the organization into a combination staffing system to ensure adequate personnel are available for the safe delivery of fire and emergency medical response.

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Adapting to meet the challenges for staffing at the Endicott, NY fire department.

Introduction

The Endicott Fire Department (EFD) has lost one third of its uniformed personnel due to fiscal instability of the municipality. The research problem is that these negative impacts to staffing levels have compromised the delivery of fire and rescue services, placing the municipality at increased risk for firefighter injury, property loss and life loss. As additional economic pressure is put on the municipality to contain costs and stabilize the taxing district the fire departments is likely to see budget cuts or cost containment measures imposed on them. Personnel budgets for career staffed fire departments continue to increase as health care costs and retirement contributions rise at extreme rates. The ability to rein in the cost of fire protection in career staffed departments is a battle where most budget cuts directly relate to some form of cuts or modifications to staffing.

The purpose of this applied research is to construct a sustainable staffing model that will meet the service demands placed on the agency for fire and emergency medical response within the financial constraints placed on the department by the municipality. Action research was used to answer the following research questions. What methods of overall cost reduction could be incorporated into a newly constructed staffing model? How does the organization's current staffing model compare to other fire service agencies with similar demographics? What staffing models are available that can provide adequate service levels? What are the advantages and disadvantages to the identified models? What challenges would the department face in adopting the newly constructed staffing model?

Background and Significance

The EFD is a fully career staffed department that is an all hazard response agency focusing on fire suppression, tactical and specialized rescue, emergency medical first response and code enforcement. Thirty five sworn personnel operate out of a single fire headquarters that covers an urban response area of 2.5 square miles. The birthplace of IBM Corporation, the municipality centers on a sprawling industrial complex that was constructed starting around 1910 and continued for the next 5 decades. By the late 1980's international competition had started to take its toll on the computer giant and the area shed jobs by the thousands. With aging housing stock and limited land for new construction the municipality found it difficult to bring in new sources of property tax revenue to stabilize the tax base. This problem is exacerbated by subsurface pollution problems from numerous businesses and industry that have created vapor intrusion into the residential and business properties within a large portion of the municipality and has caused the tax base to decline over the past decade. As an older community incorporated in 1901 the Village of Endicott has very little developable land left that can offset this loss and increase taxable revenue.

The number of fire personnel has steadily dwindled from a high of 50 in the 1990's to the present 32 line personnel in service today. The current organizational chart of the fire department breaks down into a chief, deputy chief, daytime fire and code inspector and 4 platoons each having a captain, lieutenant, fire and code inspector and 5 firefighters (Appendix A). The four platoons operate on a 24 hour schedule which consists of 24 hours on, 24 hours off, 24 hours on, 5 days off. There is currently no minimum staffing number defined through contractual language in the agreement with the International Association of Firefighters (IAFF)

Endicott Firefighters Local 1280 or set through fire department standard operating procedures due to the mandates of elected officials.

In early 2003, facing a mounting financial crisis the elected mayor sought to cut the department staff by 50%, equaling 20 career line staff. Fiscal mismanagement and lawsuits during the timeframe of 2000 through 2003 left the municipality at a 1.3 million dollar deficit by the end of this period. As the plan for cutting half of the suppression staff was not well documented or fact based it never garnered enough support from the governing board, however it did eventually force the layoff of 4 personnel in June of 2004. During these tumultuous times the municipality was forced to apply for and did receive deficit funding from the state of New York to meet payroll and other financial obligations. In early 2005 elected officials authorized a retirement incentive to all retirement eligible fire personnel which included a $15,000 stipend and an annual $850 health insurance premium for the life of the member. 7 additional fire personnel eventually opted to take the retirement incentive thereby reducing the number of line staff to 30. Contractual language regarding the incentive allowed for rehires to bring the total number of suppression personnel back to 32.

The new five year contract between the municipality and Endicott firefighters signed in June of 2004 did not include a minimum staffing clause. In a cost saving effort, elected officials sought to fight an ever increasing overtime budget by addressing the use of overtime to replace firefighters when sick time, accrued time off (ATO), personal time or injury brought the number of on duty personnel below 6. Prior to September 2005, an unwritten minimum staffing clause of 6 firefighters was observed by sitting Chief S. Andrew. Throughout his tenure as chief the overtime continued to rise significantly as sick time use became excessively high. This cycle of high sick time perpetuated a never ending need of overtime for firefighters. In addition the

contract immediately preceding the 2004 signed document enabled firefighters to accrue up to 400 hours of overtime (compensatory time) that could either be taken as assigned time off or cashed in for pay. While allowed by labor law this effectively compounded the problem by hiding the true cost of replacing firefighters through an elaborate set of bookkeeping to push the cost off to future budget years. As it took the average firefighter 2 to 3 years to build up to 400 hours of banked time these monies were not reflected in actual expenditures in current years budgets. Additional flaws with this accrual system is that all time banked in these accounts are paid at the current prevailing rate which includes raises and promotions and this has driven up the financial liability to the municipality. With past budgets the municipality has not addressed this hidden $200,000 plus liability accrued in all of the ATO accounts. Past practice has been to set an arbitrary number aside in an overtime line to account for payout for a portion of this money. The monies delegated to this annual overtime line have never been enough to satisfy the liability of these accounts.

Throughout the time when fire department staffing levels have fallen to all time lows, service requests have risen dramatically. For the last 10 year period from 1999 to 2008, requests for service have increased 62.6%. Of the 2,685 calls for service in 2008, 68% were for Emergency Medical Services (EMS) first response at a basic life support (BLS) level. The EMS first response program was instituted in 1995 and a result call volumes have increased dramatically since its inception. The fire department receives no special funding from any source for its EMS program however over the past year a committee has been set up to investigate moving toward a fire based EMS transport agency. The driving factor behind this investigative committee is to enhance the EMS delivery system in the response district while tapping a new revenue source for the fire department. Other important specialized services that

the EFD also provides are code enforcement of both New York State codes and local law and confined space rescue. The code enforcement office does provide a revenue stream to the municipality that totals close to $50,000 to $60,000 per year.

The fire department continues to struggle with maintaining sufficient staffing especially during the summer months during peak times of vacation. Fire department staffing continually hovers around 5 to 6 personnel during the May to September timeframe, sometimes dropping to 4 personnel at times. At other times of the year, October to April, staffing consistently remains at 7 or 8 personnel. With no minimum staffing clause and mandates from elected officials to not use overtime for staffing the department is unable to call in to reinforce on duty personnel. The department does maintain an apparatus staffing standard operating procedure (SOP) that accounts for variable personnel staffing from levels 8 down to 1 (Appendix B). The EFD is forced to rely on a web of automatic and situational mutual aid determined by run cards from surrounding volunteer departments. The department also utilizes call backs for personnel should a fire or emergency occur that requires more manpower than is available at that time. This is a contractual requirement that was negotiated with the municipality stating that Endicott firefighters will be called first when a fire or emergency requires more firefighters that are currently on duty. This poses multiple problems as there are no performance standards or markers that are currently in place at EFD for these call back scenarios. Most of the career staff of firefighters live outside the response district and average a 14.24 minute drive time from home to fire headquarters not including turn out time. As a second or third alarm normally occurs somewhere between the 3 to 8 minute mark after dispatch, when adding turn out time, drive time and then responding into the incident with apparatus the average firefighter response is close to or greater than 20 minute timeframe. This large timeframe and the fact of an unknown number

of responders leave a wide gap during the initial phase of an incident where on scene firefighter life safety is of the utmost importance. The result is a system that is in dire need of overhaul to address second and third alarm incidents when additional firefighters are needed in an expedient manner. The initial response with low manpower levels also severely hampers search and rescue operations for fire victims.

In depth background of the problems associated with the existing scenario as well as research and evaluation of alternatives to develop a sustainable staffing model directly correlates with multiple operational objectives of the United States Fire Administration of reducing loss of life. The significance of the research is that by developing a workable staffing model within the financial constructs of the municipality the organization will be able adapt to meet the rising fire and emergency medical demands of the community.

Literature Review

A comprehensive literature review of pertinent subject material was initiated through multiple sources including the Learning Resource Center at the National Fire Academy, retrieval of documentation through the internet and personal interviews with fire chiefs, elected officials and data analysts. Data was also gathered from multiple sources and included national fire department census data, U.S. census information and through the development of a questionnaire. The culmination of all sources provided the necessary documentation to address the 5 research questions contained therein.

1. What methods of overall cost reduction could be incorporated into a newly constructed staffing model?

The challenges that are facing fire departments across the nation are hardly new. In 2004, the International Association of Fire Chiefs (IAFC) summarized the results of their 2004 Issues Assessment Survey as showing that budgets and staffing topped the list of problems. 57% of survey respondents from all fire department types (career, combination and volunteer) stated that they were plagued with staffing issues. All problems revealed in the survey directly related to falling budgets and their effect on fire department operations. Stopping short of providing hard solutions to staffing the IAFC addressed the concern by attempting to provide data and statistics of budgets and salaries from fire departments across the country to try and help fire chief's build a successful solution to staffing woes.

The economic crisis that is currently affecting fire departments nationwide means that new innovative ways of providing service levels are going to be a top priority for chief administrators as budgets shrink, funding streams dry up and the cost of doing business rises. The current issue with the cataclysmic state of the economy is unlike any sitting fire chief has ever experienced. With economic indicators pointing to a prolonged recession and even a depression that will rival the 1930's, the financial system is in jeopardy and fearful investors continue to pull funds out of the market (Zuckerman, 2008). The effects of the economic downturn are far reaching and will likely leave no department untouched. Even metro sized departments are taking budget hits that are going to have defining consequences on staffing (Farinacci, 2009). Fire chiefs across the nation will undoubtedly find that this will be a defining moment in their department's history with the ramifications of staffing or budget cuts affecting operations, firefighter and civilian death and injury and fire loss (Thompson, 2008).

The International Association of Fire Chiefs (IAFC) describes the current economic environment as the proverbial "perfect storm" (International Association of Fire Chiefs, 2008, p.

4). However looking for opportunities to grow out of these stanch conditions is a way that fire departments can rethink the methods and ways that they currently operate. To approach the economic problem head on through strong financial management department administrators will be better prepared to move or adapt quickly to these changing conditions. A three pronged strategy that incorporates financial diversification, gaining efficiencies and service reductions will help fire departments ride out the current economic turmoil. Managing your revenue stream and taking a fresh look at new sources of revenue, as well as reducing costs through interagency cooperation or consolidation can help diversify in tough times. Fire chiefs should also be ready to look at the service levels that they currently provide and whether these can be maintained should budget cuts affect staffing and operations (International Association of Fire Chiefs, 2008).

Reducing overall costs within an organization can result from a number of different options that include; decreasing overhead, reductions in payroll expenses, reductions in health care costs or increasing revenue. The latter can come in many forms by increasing taxes such as property, sales, sin, consumption, utility, insurance, fire and use. These taxes coupled with other revenue sources such as license and permit fees, service fees, subscription fees and fines and penalties can help bridge the gap with regard to shrinking budgets (Schnuer, 2003).

As personnel costs continue to grow due to salary and benefits packages and legacy costs increase for older municipalities the ability to fund public safety has received another look from elected officials. The picture is quite different for older municipalities due to retired workers and the costs associated with them. A correlation to this scenario can be made by looking at car manufacturer's General Motors (GM), Ford and Chrysler. Retiree or legacy costs for the big three automakers now add $3000 to the cost of each new automobile (Gold, 2008).

Consolidation or sharing of services with other organizations or entities can be an effective solution to trim rising personnel costs for a municipality. Evaluating potential mergers or sharing services to maintain service levels while municipalities struggle with personnel costs has shown a flurry of activity in light of the economic times. These options could include consolidation of departments or simply just sharing administration between them (Crowe, 2009). The EFD operates within a single township that has another career department with 40 personnel as well as 6 fully volunteer staffed departments and an ambulance service using a combination career and volunteer force.

The 2008-2009 EFD budget (Appendix B) shows that of the total 3.95 million dollars allocated for fire protection, only $185,900 was for operational costs. These costs, while not fixed, equate to only 4.65% of the entire budget. Operational costs continue to rise as fuel, utilities and maintenance on the 45 year old fire headquarters climbs. The areas within the operational budget to decrease overhead or trim costs are extremely limited and show no avenue to enhance the overall financial health of the fire department. With over 95% of the entire budget dedicated to personnel costs any substantial cost savings would have to address these line items. It should be noted while reviewing other agencies budgets there was a large disconnect in the overall accounting strategies in place across the board. Some departments incorporated legacy costs of retiree pensions and health benefit packages while others did not. These different strategies or accounting methods made it difficult to assess total fire protection costs that include operational and personnel cost factors. After taking this into account and removing the legacy costs associated with retirees and injured firefighters the fire protection the EFD operational versus personnel costs broke down into a 6.6% / 93.4% ratio.

2. How does the organization's current staffing model compare to fire service agencies with similar demographics?

Evaluation of industry standards in respect to staffing and deployment is a necessity when developing staffing models and objectives for fire departments. Over the past three decades the core mission, activity levels and public expectation of local fire departments have increased to include services outside the operations of traditional fire suppression and prevention. As these activity levels increase, steps must be taken to ensure that resources are managed and deployed accounting for the risk and service commitment within a community. The driving cause of staffing and deployment of firefighters for every fire department is related to the risk management and firefighter health and safety at a local level. (Smith, 2005)

Coleman (2005) suggests that administrators should be concerned with using obscure numbers and their use when determining staffing levels. Many departments nationwide use these figures as comparison models against other agencies and allow them to drive fire protection funding. Examples of these figures include per capita fire cost and firefighters per thousand ratios which can vary wildly or seem remarkably similar while really having little value when determining staffing requirements within a municipality (Coleman, 2005).

The development of national standards for the organization and deployment of fire suppression forces by the National Fire Protection Association (NFPA) in 2001 and then revised in 2004, was the first attempt to provide standardization to the all response capabilities by career fire departments. The document, NFPA 1710, *Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments* sets mandatory requirements for organizational, evaluation, staffing, response and deployment of personnel. The standard points to a series of 5 determining

factors to establish on duty staffing numbers for fire suppression personnel. A synopsis of these factors include; life hazards, safe and effective firefighting conditions, potential for property loss, geographical and natural barriers to fire suppression and standard tactics and equipment utilized at the fire scene. The standard also mandates a minimum of four on duty personnel for any engine companies and ladder companies and relegates other operational units to have staffing levels equipped to handle situations as determined by the authority having jurisdiction (AHJ). In addition to the staffing requirement set forth in NFPA 1710 the standard also addresses time objectives that include a 1 minute turnout time (time from acknowledgement of call until first unit is responding), 4 minute or less arrival time for the first engine company, 4 minute arrival time for a EMS first response unit and 8 minute arrival time for ALS EMS response. For this research it is important to note that NFPA 1710 also sets provisions that allow for inclusion of agreements of automatic mutual aid and mutual aid from other agencies to meet the requirements of fire suppression services, which include on duty staffing (National Fire Protection Association, 2004).

The Insurance Services Organization (ISO) is yet another entity that has recently weighed in on staffing problems with fire departments across the nation. In a recent independent study commissioned by ISO and conducted by Opinion Research Corporation (ORC) that included a random sample of 500 fire chiefs from across the nation found that the majority of fire departments rely on assistance for their fire suppression efforts (Kenney & Malinowski, 2008). These problems exist throughout the nation in career, combination and volunteer systems and points to the issues facing fire departments in regard to their use of limited resources. The single most prevalent reason for requesting assistance through mutual aid from neighboring communities was the need for additional staff (Kenney & Malinowski, 2008).

By far the most robust information located regarding fire department staff modeling as compared to the requirements of NFPA 1710 was garnered from M. Fay, president of Animated Data, Incorporated. According to Fay (personal communication, February 4, 2009) the single largest variable in the staff modeling equation is the overlap of incidents. Through historical analysis of empirical data that evaluates types of incidents and incident overlap; it is possible to develop staffing models that meet NFPA 1710 requirements. Fay (personal communication, February 4, 2009) suggests that in general NFPA 1710 does a great job of raising the right questions, providing valid systems for measurement and providing a standardized vocabulary for discussing fire department performance. He does surmise that the standard has less value when trying to mold or force fit these specific measurements to local fire departments. An example of this challenge is the NFPA requirement of a 1 minute turnout time from the time of call to have the first units responding. Fay (personal communication, February 4, 2009) states in makes more sense when working with a local fire department to adjust specific measurements such as turnout time to fit local response conditions.

Fay (personal communication, February 4, 2009) suggests the major factors and methodology that are incorporated into staff modeling are type of incident, incident overlap and incident duration. While the NFPA 1710 standard looks at some of these factors it does not take into account the cumulative effects of the situation on the ground in any given fire department. Services that fire departments nationwide provide continues to increase into areas such as emergency medical services, technical rescue and other non traditional fire suppression related activities. The most prevalent of these service level changes across the board are some facet of emergency medical service by fire suppression personnel. While other factors do play into the

equation, in smaller organizations with limited geography, these rarely have a causal affect on the need to increase staffing.

Information gleaned from the national fire department census database maintained by the United States Fire Administration (USFA) shows that there are 134 fire departments with at least a partial makeup of career staff in New York State. Of these agencies the census breaks them down into 3 categories of fully career staffed, mostly career staffed and mostly volunteer staffed. Of the departments more demographically similar to EFD, evaluation of the 42 career and combination systems (Appendix D) with populations under 20,000 shows that 42.8% are fully career staffed, 16.7% are mostly career staffed and another 40.5% are mostly volunteer staffed. (Figure 1)

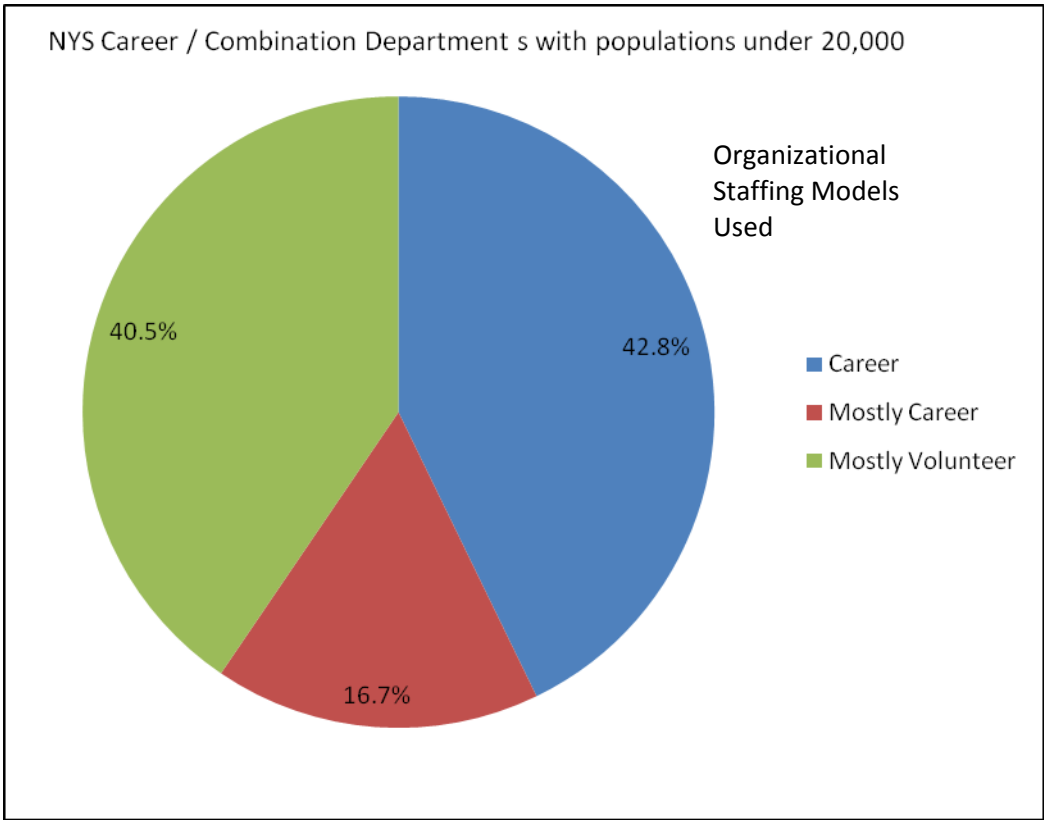

Figure 1

The average number firefighters staffing these career and combination agencies breakdown as follows: career firefighters 26.6, volunteer firefighters 18.3, part time firefighters 1.4. (Figure 2)

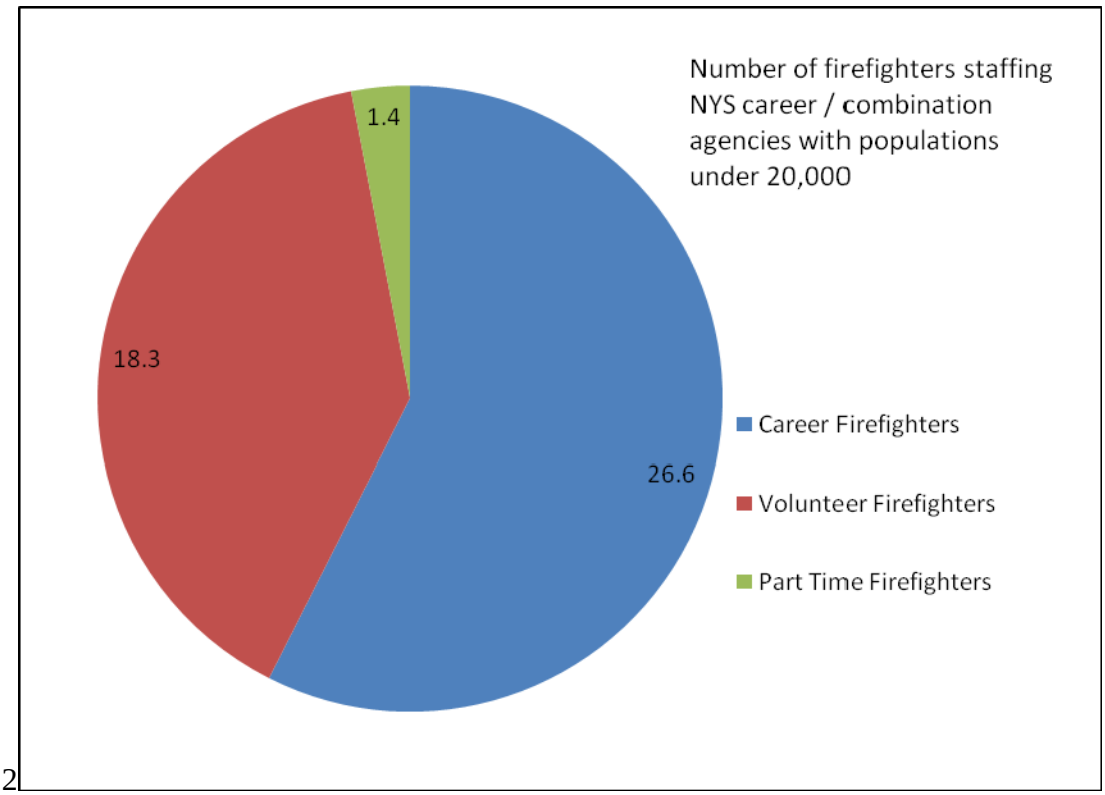

Figure 2

The EFD is unique when compared to the organizations that were evaluated through the Fire and Medical Response Agency Demographics Questionnaire (Appendix E). The EFD has no contractual language regarding minimum staffing and in 2005 Mayor J. Pulse and elected officials formally stated that they would not authorize the fire chief to use overtime to staff a minimum number of firefighters (J. Pulse, personal communication, January 12, 2009). Of the responding agencies 71% had no contractual language regarding a minimum staffing number for their department; however 100% maintained some minimum number of personnel each day. 83% of respondents utilized overtime as the sole means to provide for daily minimum staffing requirements. The other 17% used a combination of part time personnel, offered comp time or

had volunteer forces man their stations for minimum staffing. Of the fire departments responding to the questionnaire the minimum staffing numbers for manpower varied widely across numerous population densities served. The data which has been truncated to departments serving populations fewer than 50,000 show that the variance in the data can be partially attributed to EMS service levels in the response area of these departments. (Figure 3)

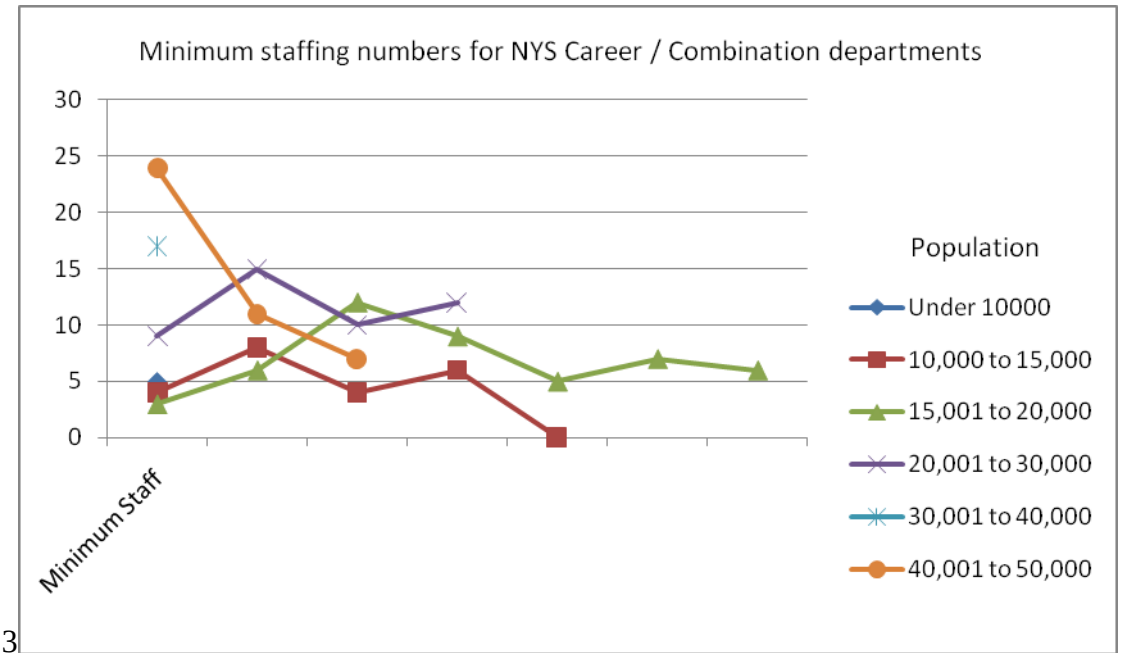

Figure 3

Another important piece of information obtained from the demographics questionnaire was the number of responding fire departments that were staffing their engine and ladder companies to meet NFPA 1710 standards. Of the 24 career and combination agencies that would fall under the NFPA 1710 standard the following graphs show the disparity fire departments are having meeting the standard as only 34.8% were staffing engine companies with 4 personnel and a paltry 13% of ladder companies were staffed with 4. (Figures 4 and 5) This makes an important point regarding the problems that career and combination departments are having with meeting the requirements for initial response that are included in the standard.

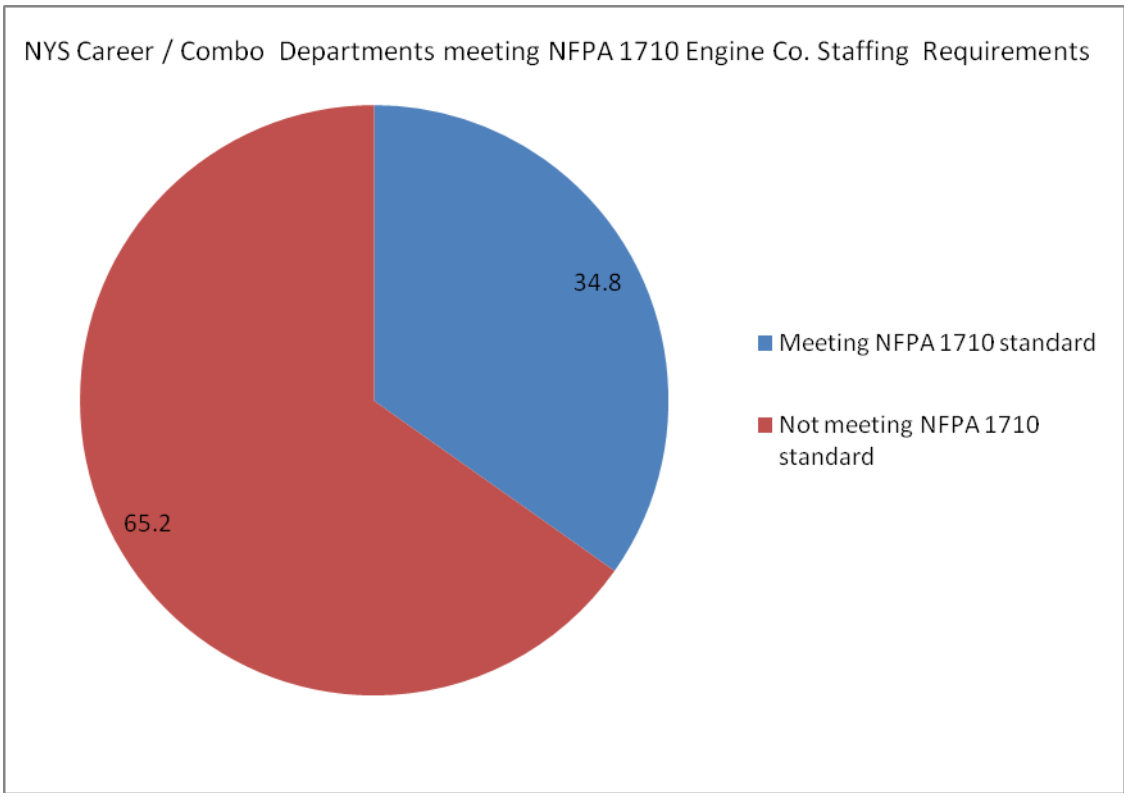

Figure 4

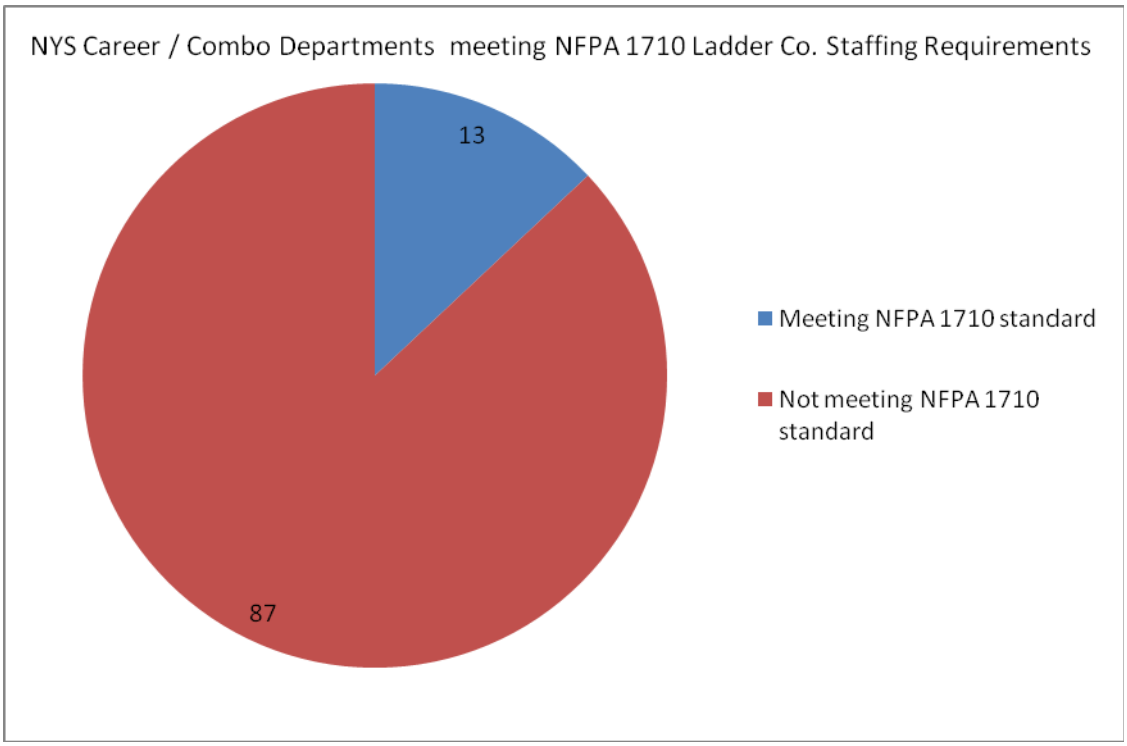

Figure 5

3. What staffing models are available that can provide adequate service levels?

Countless variations of numerous staffing models exist in the career and combination sectors of today's fire service. Theoretical evaluation of these models is based on breaking them into 2 distinct categories of constant staffing or overstaffing. The difference between these 2 models is that constant staffing utilizes overtime to backfill positions temporarily vacated by vacation, sick or injury time while overstaffing has enough staffing built in to fill these voids. By calculating the department's annual leave and matching this with their staffing requirements they can evaluate which of these options best suits their fiscal needs. Savings can be found using a constant staffing model when employee salary and benefit packages equal more than an employees' overtime pay. However, there are drawbacks that include managing and deploying forces on overtime (Martin, 2008).

Department staffing models are as different as the communities they protect. Unlike nationally accepted standards such as NFPA 1710, there is little in way of standards for setting fire department organization and most is left up to local law, tradition and contractual language within a municipality. A thorough evaluation of the data provided by the Fire and Medical Response Agency Demographics Questionnaire send to New York state career and combination departments show that even split of 50% of the responding fire departments utilizes either a 24 hour work schedule or shift work. The only type of shift work utilized was the 10-14 schedule (10 hour days, 14 hour nights). 92% of the respondents used a 4 group or platoon system within their organization with the other 8% using a 3 group or platoon system.

Maintaining fire department staffing by utilizing a supplemental personnel pool brings to light additional ways that fire departments are meeting the needs of the communities they serve.

This can be broken down into 2 major categories of modeling that include part time and combination systems.

Of the departments evaluated through the demographics questionnaire and census data, part time firefighters were identified as a choice that few fire departments make use of for staff augmentation. Only 2 of the 24 fire departments responding to the demographics questionnaire were utilizing part time or on call personnel. An in-depth look at career and combination fire departments in New York State serving populations of under 20,000 show that only 12% employ part time or paid per call firefighters.

Part time personnel or slight variations called extra board or paid per call personnel by some departments offer an alternative approach to the constant or overstaffing models that are the norm in today's fire service. Part time employees allow a municipality to staff to their requirements while reducing overtime expenses. S. Monroe (personal communication, January 22, 2009) chief of the Corning, NY fire department is an administrator that utilizes part time forces first to staff to a minimum level on an ongoing basis. Chief S. Monroe (personal communication, January 22, 2009) suggests that they are an effective way to reduce overall overtime costs as their hourly wage is lower and they have no benefits packages, but there are drawbacks to the program. Issues including a limit on the number of hours they can work per year and training standards are some of the problems associated with the use of part time personnel. They have been successful in designing an equivalent training curriculum for their part time personnel that meets the requirements of the New York State 229 curriculum for professional career firefighters. The Corning, NY fire department was included in the census figures and demographics questionnaire and falls into the minority of career / combination fire departments in New York State that utilize part time forces. When staffing to their minimum

number of 6 firefighters per shift they first move to bring in a part time firefighter before moving to overtime to fill the open position (S. Monroe, personal communication, January 22, 2009).

Other departments utilize a similar approach with extra board personnel that work part time to fill staffing needs. These forces are considered permanent substitutes and work on a part time basis until a full time opening arises within the department that can move into. This concept was originally devised by the railroad system and has moved into other professions as the need arises to contain costs. While this can help contain overtime costs and put firefighters on the floor it does not come without its drawbacks. Issues such as full time personnel bearing resentment over losing overtime and negative or harsh treatment of part time employees by full time personnel are the largest detractors (Allison, 2006). Although there are some positive attributes being shown by some career staff in departments that see part timers as a plus as it allows them more scheduling freedom (Trotter, 2007).

Combination systems which use volunteer supplementation for emergency response are found throughout the United States. This is a common practice which has normally worked its way from a wholly volunteer staffed department to hiring a number of career firefighters as the response demands increase beyond the capabilities of the volunteer staff. Evaluation of the national fire department census database maintained by the USFA shows that 33% of the municipalities within New York State with career staff and protecting a population under 20,000 people were a combination system that included volunteer personnel. Chief J. Harrington (personal communication, February 18, 2009) likes to use the term blended fire department to address his agency in the Gates-Chili suburb of Rochester, N.Y... His department utilizes a mix of career and volunteer staff to protect a population of 32,000 residents and respond to over 3200 emergency's a year. The department staffs enough career personnel to respond to the high

volume, low impact incidents and augments with volunteers when additional manpower is needed.

These systems are widely used as it doesn't matter how many career or volunteer members exist within an organization it is still considered a combination system. Departments that move from an all volunteer staff to a combination one need to pass through some transitional phase of staffing that often includes some of the options previously mentioned with part time or paid per call employees. However problems previously identified with those staffing models can exist in the combination system as well. Other concerns of combination departments relate to training programs and qualifications of individual members. But by far the most recognized issue in departments utilizing a combination staffing system is the management of the relationship between the volunteer and career staff (Scott & Windisch, 2006).

A hybrid of the combination system is the bunker program where volunteer staff is gathered from outside the local area. These programs have shown limited success in helping fire departments maintain a talent source for staffing. By utilizing collegiate level students to assist with staffing in return for housing during the school year, departments are able to boost manpower levels while members are present at the station. These types of programs also benefit the student as they are able to substantially reduce their overall college costs from free housing. Students are normally associated with fire departments outside of the local area and apply for membership in the bunker program of the sponsoring fire department. Of the organizations that were evaluated through the Fire and Medical Response Agency Demographics Questionnaire only the Ithaca, NY fire department utilized a bunker program to boost staffing levels. There were numerous other bunker programs in New York State that are successfully being utilized by volunteer organizations to augment their staffing requirements.

The last staffing concept investigated was that of demand led staffing. This model is based around assisting fire and EMS agencies by matching staffing requirements to periods of peak demand. M. Fay (personal communication, February 3, 2009) states that through evaluation of empirical data gathered from the NFIRS system nationally recognized times of peak demand for fire and EMS activity are from 8 a.m. to 8 p.m... The methodology associated with demand led staffing looks at the net hours that a firefighter is operational by subtracting vacation, sick and training time and then rostering resources around peak activity levels (Sandles, 2006). This concept of demand led staffing is more widely accepted and used in police and EMS only agencies that deploy staffing shifts on a 8 hour or 10/14 schedule. More common in the fire service today is the use of engine or truck companies that shift their primary response from fire emergencies to basic or advanced life support to target periods of peak demand for EMS activity.

4. What are the advantages and disadvantages to the identified models?

The staffing models identified through a literature review and data interpretation from various sources included; constant staffing, departmental reorganization, part time supplemental personnel, combination systems and demand led staffing. Overstaffing was not identified as a solution regarding a sustainable staffing model as it was outside the scope of the financial constraints currently in place.

Constant staffing does cut down on personnel costs by keeping the numbers of staff to overall lower levels. By utilizing this concept savings are found by cutting the fully loaded costs of employees (Martin, 2008). As the overhead for employee's benefits, retirement, social security and workman's compensation packages continue to skyrocket employers are finding that cutting the number of employees and using overtime is a fiscally prudent means to control costs.

However, constant staffing models bring issues with the overhead of managing an overtime program to ensure that personnel are available to meet the staffing requirements. Depending on the amount of personnel available to fill open shifts the department faces the complex task of program design to meet these needs. Martin (2008) suggests that one a weak point of the constant staffing model is the propensity to overwork some employees who constantly take overtime assignments. As contractual language is often found that addresses the distribution of overtime to labor group members, getting the input of labor groups regarding decision making and the fair distribution of overtime is the key to successful implementation regarding these programs (Daines & Garfield, 2006).

Departmental reorganization provides a means to address staffing shortages and safety concerns by redeploying manpower through a different staff modeling scenario. One possible modeling change identified through the demographics questionnaire found that 8% of respondents use a 3 platoon or group system as opposed to a 4 platoon or group system. Reorganization to this 3 platoon model could have the ability to immediately increase the number of firefighters per shift and allow for the availability of these additional resources to cover vacations and sick time. This change could also have a positive impact on the ability to meet increasing demand and national standards such as NFPA 1710. The model could possibly bring additional promotional opportunities that address span of control and assist in covering sick and vacation time for company officers. The drawbacks or detractors from this change would be that there would likely be issues with the labor group as changes to the current labor agreement would be needed and a program to manage additional time off as personnel would work additional hours when compared to the current schedule. On another note, elected officials

could see this possibility as a yet another way to decrease staffing levels to the same levels as used in the 4 platoon system.

Part time or extra board personnel can provide the needed relief to overtime by allowing a department to meet the demands for filling extra positions that are unmanned due to vacation, sick time or injury. Allison (2006) suggests that using part time employees can help lower a department's overtime budget and provide benefits to both the career personnel and part timers. It also provides a means to meet scheduling demands for personal leave and department authorized training. An organization can also get a look at prospective new hires and evaluate them while working part time. Utilization of part time personnel also brings the challenge of managing the availability of these personnel. S. Monroe (personal communication, January 22, 2009) has found that part time personnel are not always available to fill needed staff positions or have already surpassed the hours allowed law. Other management issues consist of setting training requirements and managing the relationship between career and part time staff.

Moving to combination system by either opening up the organization to volunteers or through a bunker program can have many positive or negative consequences. There are many successful combination systems in use throughout the nation. The benefits include reduced costs of operation by using volunteers to staff additional apparatus as well as diversifying the organization. This advantage exists because only enough career personnel are staffed to respond to the high volume, low impact incidents and are augmented by volunteers when at large scale incidents requiring more manpower (J. Harrington, personal communication, February 18, 2009).

Scott and Windisch (2006) identify any department undergoing a transformation to a combination system as pioneers. The possibilities are endless when evaluating moving to a combination system as the department can design the requirements of staffing, training and

membership to meet its and the communities needs. Again most of the literature available today regarding combination systems looks at the management of the relationship between career and volunteer forces. Rielage (2006) states “Without solid professional leadership, a combination department could quickly fragment into several factions that could result in a severely dysfunctional organization” (p. 50). Undoubtedly labor organizations and their members would see the transition from a career staffed agency to a combination system as a threat to their existence as well as a massive organizational and cultural change.

Bunker programs bring the many of the same benefits and detractors as combination systems. The department does benefit by having these personnel available for response however there are issues with long breaks when the students return home and managing the culture of young college aged students. Proactive management of bunker programs and thorough evaluation of candidates can prevent some of these pitfalls.

The Ithaca, NY fire department has a long standing history of using bunkers to augment their career staff. Starting in the early 1900’s they utilized students from Cornell University and Ithaca College as bunkers in their stations. Training of these personnel was defined as the most important aspect of the success of this long standing program. Ithaca, NY Chief B. Wilbur (personal communication, February 12, 2009) suggested that the training program allowed the bunkers to earn the respect of their career peers. While the departments 3 week, 120 hour training curriculum was good, he acknowledges that it was expensive. Eventually, organizational changes within the department and financial challenges for the municipality led to the programs demise. Through the 80’s and 90’s the number of bunkers declined significantly and the last bunker was hired 1 ½ years ago. As found within combination systems the active

management of the relationships between bunkers and career staff was another key component to the program's success over the years (B. Wilbur, personal communication, February 12, 2009).

5. What challenges would the department face in adopting the newly constructed staffing plan?

Undoubtedly the adoption of a new staffing plan could introduce many faces of change across the department. These changes may well be organizational when considering a new model that would alter the current 4 platoon structure or 24 hour schedule. Wallace (2006) states "Change is difficult. Most fire departments are not described as change-friendly organizations." (p. 92). Meeting the ever changing demands for services that have resulted from changes within the community that have occurred over time, dictates the need for changes at the organizational level. Organizational change can be small or large, short lived or ongoing to meet the needs of the department. Assessing and making necessary changes allow an organization to meet new challenges and create new opportunities (Saint Cloud Fire Department, 2005). The largest challenge regarding organizational change needed to implement a newly constructed staffing plan would be buy in from members across the organization. Should the reason to change not be apparent or not have value to the member getting their cooperation and allegiance would likely be difficult (Wallace, 2006).

A newly constructed staffing plan would also introduce major cultural changes and stumbling blocks for the department. A common theme heard in firehouses across the county is regarding the traditions in which the fire department beliefs, values and culture are built around. Organizational culture is the product of two major sources, values and beliefs. Both of these sources are formed from two distinct factors of influence, past experiences and environment (both internal and external) (FEMA, 2006). A new staffing model may introduce a cultural threat to the stakeholders in the organization. Managing the cultural change to produce the

desired effects needed to meet the change in service demands would likely cause distention among a subset of the organization. Cochran (2006) states “Employee satisfaction is a major contributor to the success of fire departments. There is a distinct correlation between morale and productivity.” (p. 17). The group dynamics regarding a large cultural change within the organization could end up being a stumbling block to success.

Implementation of a new staffing model would likely introduce significant organizational and cultural change within the department. Proactive management of the elements of change would undoubtedly be necessary to provide a workable and sustainable model.

The literature review completed to answer the research questions contained in this ARP generally supported and reinforced the authors thoughts on staffing, service levels and the deployment of resources. One notable difference was the information uncovered that provided insight into the cultural aspects of change and management of diversity within combination organizations. This material brought realization into the scope and depth of meeting the demands of these issues.

Procedures

Procedures for this action research project were based on information and empirical data drawn from a wide range of sources. The literature review encompassed both fire service and business industry documentation regarding staff modeling, recognized standards, cost reduction analysis and best practices in use today. The objectives of the procedures utilized were to locate fire departments within similar communities and incorporate the best practices of the whole to construct a workable and sustainable staffing model.

Development of a questionnaire was used to collect demographic and agency specific information that was utilized to compare staffing and cost associated with the operation of similar agencies offering like services. The Fire and Medical Response Agency Demographics Questionnaire (Appendix E) was provided to career fire chiefs of both career and combination departments in New York State to collect data specific to these organizations. The methodology used in the development of this questionnaire focused on agency demographics, organization size, services provided and overall costs associated with their operations. Also included were questions to gather information on staffing models, minimum staffing numbers and organizational structure. The questionnaire was mailed, emailed, faxed and provided at a meeting of the New York State Career Fire Chiefs Association along with a brief letter (Appendix F) explaining the research background and survey objectives. The questionnaire consisted of 18 questions that provided insight into community and agency demographics, staffing and service levels. These included: 1. Population served? 2. Square miles of response area? 3. Type of department (career, combination, volunteer)? 4. Current size of your department? 5. If combination department, number of career, part time and volunteer personnel? 6. Number of groups, shifts or platoons? 7. Type of shift schedule used (i.e. 24hr/1 on-2 off, 10-14, 8 hr. shifts, etc…)? 8. Minimum staffing number (if you have one)? 9. Is the minimum staffing number contractual? 10. How do you meet minimum staffing numbers (overtime, part time, volunteer)? 11. What is your current fire department budget? 12. What is your budgeted overtime? Do you exceed that amount on an annual basis? 13. Number of personnel assigned to engine companies? 14. Number of personnel assigned to ladder companies? 15. Do you provide Emergency Medical Services? 16. If yes to #15, what level of service do you provide (First Response, BLS Transport, ALS Transport)? 17. How many trained EMS personnel do you have

on staff? 18. What level are these EMS personnel trained to (First Responder, EMT, Paramedic)?

Detailed information was also collected from the National Fire Department Census Database maintained by the United States Fire Administration (USFA) for fire departments within New York State. This data was then pared down to include only career and combination systems and merged with population, median income and median home values gathered from the latest 2007 update to the United States census which provides comprehensive data on municipalities across the country. Again the methodology used was to find agencies protecting communities that are similar in respect to population, growth and socioeconomic stature. Concentration was again on New York State fire departments in an attempt to remain within the constraints of economic conditions within a similar geographic area. Specifically removed from the fire department demographic information table were specific counties located just north of New York City and the Long Island corridor. The concentrated population and abnormally high median incomes and home values in these areas skewed the data and did not represent the same socioeconomic conditions found in upstate counties of New York.

Limitations and Assumptions

Evaluation of the data derived from the questionnaire, census and comprehensive municipal profiles only extracted a very small cross section of the fire departments in the nation. A more detailed analysis of this information as it pertains to a greater sample of fire departments nationwide would be helpful in lending credibility to the results of the research. Within the time constraints of the research project looking at a nationwide approach was not viable. The research

also was limited in the fact that it only evaluated career and combination departments in regards to meeting the demands of staffing in their operational effort.

Assumptions were made regarding the validity of the fire department census data used in this research. The controls over agencies responsible for providing and updating organizational data to the USFA are loose and may not be kept up to date by each individual department. The author also found errors in fire department census data downloaded and made all attempts to verify this information through phone calls and other web based documentation. The USFA who maintains the national fire department census database falls short in making available canned reports of information based on a national level.

The author also found a void in the availability of data from new studies regarding fire department staffing. While there was no shortage of current documentation from periodicals looking at staffing problems it was difficult to locate new data derived from large scale research projects that address staffing and standards of cover over the past 3 year period. There was also a promising study being conducted by the National Institute of Standards and Technology (NIST) regarding resource deployment and crew size that may shed light on staffing management issues (Kyle, 2009). Data from this study was not available at this research project was performed.

Lastly, the author could find no recent research information on combination departments that were formed by moving from an all career force back to a combination system. Within time and due to the economic conditions fire departments are facing these types of situations would likely become more widely investigated and put to use in the coming years.

Results

1. What methods of overall cost reduction could be incorporated into a newly constructed staffing model?

The results show that fire department staffing problems have existed for quite some time on a national level and point to falling budgets as a direct cause. These facts combined with the current economic conditions will result in further hardship for fire departments seeking to stabilize their operations and staffing. The outcome of these issues will show the negative relationship that cuts to budgets and staffing have on fire deaths and fire loss. On a positive front, wading through this plethora of negativity will allow the discerning fire chief to see the importance of rethinking current solutions to sustain operational service levels. Increasing current revenue streams and seeking out new opportunities to bring funds into their operation will provide some stability to their departments, but many will be forced to examine areas of service they can no longer maintain.

Seeking to decrease overall staffing expenses by controlling personnel costs is difficult as the rate of rise within the benefits packages is outpacing inflation. This problem is a direct attack on the revenues that municipalities bring in and leave them few options but increasing taxes, fees and fines. Businesses outside of emergency services are seeing similar problems as legacy costs drive away at their competitive edge in the business world. Consolidation or sharing of services has regained momentum in many communities in the hopes of staving off inevitable problems with affordability of services.

Personnel costs at EFD, being close to 95% of the fire department budget continue to be the driving factor in looking to build a sustainable staffing model. Operational costs offer an extremely limited area for savings or cost reduction as the cost of doing business continually

rises. The municipality will be forced to evaluate changes to the staffing model through consolidation or organizational change to control these costs.

2. How does the organization's current staffing model compare to other fire service agencies with similar demographics?

The results show that while there have been national standards developed by NFPA, specifically NFPA 1710; they are loosely followed in regarding to staffing of career and combination departments. The ultimate of goal of staffing and deployment is directly associated with protection of personnel, reducing loss and managing risk. The reality of the staffing situation is that many fire departments utilize comparative methods through numeric analysis in relation to similar organizations. The drawback to this method is that it does not take into account the 5 factors NFPA 1710 recognizes as being important to determine the risk and tactics incorporated into a fire departments staffing model. Research has shown that fire departments nationwide are experiencing a shortage of resources, especially in relation to fire personnel and consistently rely on assistance in the form of mutual aid for their operations.

Empirical data analysis of historical response data has given fire departments the ability to base their staffing models on a more reliable source of information. Evaluation of historical NFIRS incidents can provide insight into areas such as incident type, overlap and duration to come up with reasonable models that staff to meet 90% of incidents with regards to NFPA 1710 standards (M. Fay, personal communication, February 4, 2009). In this respect it should be acknowledged that staffing for 100% of incidents is an unreasonable approach for fire departments to attempt or manage.

Staffing of agencies within similar demographic areas and socioeconomic conditions can be broken down into 3 distinct agency types; fully career, mostly career and mostly volunteer.

The results of fire department census data show that of the 1606 fire departments in New York State, 134 or 8.3% have some form of career staffing. When breaking down the census data further to look at communities closer to the demographics of Endicott there were 42 career or combination departments that protected populations of fewer than 20,000 people. Specifically removed from the fire department demographic information table were specific counties located just north of New York City and the Long Island corridor. The concentrated population and abnormally high median incomes and home values in these areas skewed the data and did not represent the same socioeconomic conditions found in upstate counties of New York. The average number firefighters staffing these career and combination agencies breakdown as follows: career firefighters 26.6, volunteer firefighters 18.3, part time firefighters 1.4.

The results of the Fire and Medical Response Agency Demographics Questionnaire show that the EFD is unique in the fact that it has no contractual minimum staffing clause and also has mandates from elected officials not to utilize overtime to staff to a minimum number. Data from the questionnaire show that 71% of the agencies had no contractual language regarding minimum staffing but 100% did staff to a minimum number during each shift. Of the agencies responding to the questionnaire 83% utilized overtime as the sole means of providing additional staff to meet their daily shift minimum. The other 17% of departments utilized a combination of part time personnel, offered comp time to career staff or had volunteer forces man their stations to meet their minimum requirement. The number of departments responding whether fully career staffed or using part time forces that consistently went over their budgeted overtime was 65.2%.

3. What staffing models are available that can provide adequate service levels?

The results show that there are countless variations of staffing models in use for career and combination forces in today's fire service. Theoretical characterization of staffing models is broken down into constant staffing and overstaffing. Constant staffing uses overtime or other means to backfill positions that are vacated through planned and unplanned absences. Overstaffing employs enough staff to sufficiently cover these absences without augmenting with off duty forces. It should be noted that all agencies responding to the demographics questionnaire utilized a constant staffing model.

The practical application of organizational staffing models used today varies widely throughout fire service organizations. As there are no national standards for organizational staffing methodology these staffing models are largely based on local law, tradition and contractual language with labor organizations. Evaluation of the demographics questionnaire show that an even split of 50% of the fire departments responding utilize a 24 hour work schedule or shift work. The only reported shift schedule in use by these departments was the 10-14 (10 hour days, 14 hour nights). 92% of the departments utilized a 4 group or platoon system while the other 8% of agencies used a 3 platoon system.

Staffing augmentation through supplemental, non-career personnel was found to be based around 2 categories of part time forces and combination systems. As a whole, the results also show that part time personnel are a choice that few fire departments make to augment their staffing. Data evaluation of the demographics questionnaire shows that only 2 of the 24 fire departments responding utilize part timers. A wider view through fire department census data of New York State career and combination departments serving populations under 20,000 finds that 11.9% are augmenting staff with part time personnel.

Part time personnel or slight variations called extra board or paid per call personnel offer an alternative to the constant staffing model that utilizes overtime of career firefighters. Municipalities can see some cost savings in their overtime line by back filling some positions on a temporary basis with part time forces that do not receive benefits packages and likely have lower per hour wages than career personnel. Development and delivery of training to these employees and a limit on the number of hours that part timers can work have proven to be challenges with these programs. Other departments nationwide use a similar approach with extra board personnel. Originally developed for the railroad system these personnel are used as to fill open assignments until a permanent position arises within the organization. This allows employers to get a good look at perspective employees before moving ahead to hire them on a permanent basis.

Combination systems is yet another staffing model that was discovered through research of viable systems in place in today's fire service. Augmenting career personnel with volunteer forces is common place throughout the nation and shown through evaluation of data drawn from the fire department census. It was found that 33% of the fire departments within New York State with career staff and protecting a population of fewer than 20,000 people were a combination system that included volunteer personnel. As you examine the model more closely, combination systems are extremely diverse due to transitioning within the departments as they go through being mostly-volunteer or mostly-career or somewhere in between. While using volunteer forces can help with overall cost reduction there are problems with training and member qualifications that are similar to those found when using part time forces.

A slight variation to the combination system is the bunker system that utilizes college students that exchange volunteering their time for free board at the firehouse. These programs

have shown limited success in helping fire departments maintain a talent source for staffing. Students are normally from outside the local response area and apply for membership to the hosting department and stay throughout the school year. As found with all identified programs there are pro's and con's to both the student bunker and the fire department. The program is in very limited use throughout the departments responding to the demographics questionnaire, with only one hosting student bunkers.

The last concept identified through the research was that of demand led staffing. This model looks at the net hours that a firefighter is operational and schedules their time around peak activity levels. Through evaluation of NFIRS data on a large scale the nationally recognized times for fire and EMS activity is 8 a.m. to 8 p.m. (M. Fay, personal communication, February 4, 2009). The concept of demand led staffing is a widely accepted practice used in police agencies as they deploy forces through 8 hour shifts. More common in the fire service today is the use of engine or truck companies that shift their primary response from fire emergencies to EMS response during periods of peak EMS activity.

4. What are the advantages and disadvantages to the identified models?

The results show that the staffing models identified were constant staffing, department reorganization, part time supplemental personnel, combination systems and demand led staffing. Overstaffing was not identified as a viable model for consideration due to the confines of the financial constraints in place by the municipality.

Constant staffing does have the ability to reduce costs through the management of staff numbers and overtime to fill needed staffing. The concept is based on the salary and benefits packages being higher than time and one half wages for overtime. By using overtime to fill open slots rather than maintain enough staff to cover planned and unplanned absences cost savings can

be found. The advantages with this model are that you can maintain a smaller number of staff therefore directly lowering the salary and benefits budget lines. The disadvantages with this concept are the hidden costs associated with managing an overtime program, issues with labor organizations regarding the fair distribution of overtime and the ability to fall short in filling open seats when no one is available or willing to accept the overtime. Another weak point is the tendency to overwork employees who will not turn down the opportunity for overtime.

A departmental reorganization by moving from a 4 platoon or group system to a 3 platoon or group system has the ability to immediately increase the number of personnel working per shift without negatively impacting the budget with higher costs. Of the departments responding to the demographics questionnaire it was found to be choice for a rather small minority. Only 8% of the departments utilized a 3 platoon system, with the overwhelming majority using a 4 platoon system. The advantages of a departmental reorganization to a 3 platoon system would allow for more firefighters per shift and the ability to cover planned and unplanned absences. By increasing the number of firefighters per shift additional advantages could include promotional opportunities for personnel as the span of control rises, as well as the ability to meet increased demands and NFPA 1710 standards with greater regularity. One disadvantage to this model would be creation of a program to manage additional time off as personnel would need to be scheduled for additional time off as the number of hours worked would increase. Other issues that would surface would be related to the labor organization and contractual language that would need to be changed. Lastly, changing to this system could provide elected officials with another opportunity to cut personnel and decrease on duty numbers to match those that are being used with the 4 platoon system. Again contractual language would be needed to solidify the reorganization and contain these problems.

Part time personnel to augment on duty career forces were found to be another solution that is used sparingly throughout the departments identified as demographically similar. Only 17% of New York State fire departments defined as having some career staff and protecting populations of fewer than 20,000 were found to have part time suppression forces. The advantages of the part time model are that these employees normally make a lower wage and do not have benefits packages. By using part timers in a constant staffing model savings can be found in the overtime line for fire departments. This system has also been found to allow more flexibility in regards to scheduling demands. As with the other models identified, disadvantages included development and delivery of training programs, managing the availability of part timers and relationship problems that develop between career staff and part timers.

Combination systems that include volunteer staff and the variation of using bunkers were found to be viable models for consideration. The results indicate that moving from an all career system to a combination system can have numerous issues that would need active management by administrators. The advantage to this system is that there are upfront savings that are substantial to the community. By using volunteer forces to augment fire department staffing allow immediate savings in the fully loaded personnel costs of the fire department budget. Along with cost savings, combination systems bring the aspect of diversity to the organization.

Bunker programs are a slight variation to the combination system as they use temporary volunteers in the organizational model. These programs provide a distinct benefit to the student bunker who receives free board and the host department that can use them for additional manpower when they are in the station. Drawbacks are similar to part time and larger combination systems that are discussed below but also have a unique problem of managing the relationship and culture of young college aged people.

The advantages of combination systems and bunker programs are offset by the need to meet a whole new set of demands that will be placed on the agency. With combination systems there tends to be disadvantages similar to using part time forces, namely training and qualifications of personnel. By far the most recognized disadvantage to this system is the management of the relationships and culture of the career and volunteer staff.

5. What challenges would the department face in adopting the newly constructed staffing plan?

The results show that adopting a new staffing model for the department would likely bring challenges that could be characterized as both organizational and cultural. Altering the current staffing model from the 4 platoon, 24 hour schedule would bring distention among the ranks if the reasons and need for change were not clearly identified and communicated. Organizational changes to the fire department such as going from a 4 to 3 platoon system or moving backward from the 24 hour to a shift schedule such as the 10-14 would cause issues with numbers of officers needed, possible reduction in promotional opportunities, contractual language and logistic issues. These problems could have a profound effect on job satisfaction for department employees.

As difficult as these problems may seem, the results indicate that the problems associated with the cultural change to the organization would be even greater. A staffing model change would undoubtedly threaten a good part of workforce, be it with senior men and officers worrying about entitlements such as promotions or overtime or newly hired employees fearing job cuts to the organization. The department would likely experience a breakup into factions that would try to influence the management of change within the organization. Throughout the change process morale and job satisfaction of the personnel would be a factor that would likely influence the success of the new model.

Discussion

After the evaluation of census data and reviewing staffing and service operations from other fire departments through interviews and questionnaire results it is evident that staffing models vary greatly throughout the sample area. Through the analysis of the literature and data the EFD is unique in the perspective that it operates without a minimum amount of daily staff but nevertheless it still is within the operational levels of many municipalities with similar demographics. Still the problem presents itself that standards of cover are being loosely applied causing concern for firefighter and civilian safety. It is this anomaly that now presents a problem to the EFD as few major operational changes have been made in the department over the past two decades as the municipality lost population, jobs and tax base. Although we have shed 33% of the sworn personnel over the past 15 years the risks within the community have remained relatively unchanged and the organization is now faces the challenges of continuing high levels of service with these minimal manpower levels.

The current economic indicators paint a bleak picture and a recession or depression could be a reality that we would have to endure for some years to come. Coupled with an aging population, housing stock and infrastructure severely limits the available tax base for the municipality to rely on. Personnel costs within the EFD have continually risen and the elected officials have utilized attrition or layoffs over the past 15 years to curb this increase. Built into this equation are the legacy costs of retirees of the municipality that current tax payers continue to pay for. This is in stark contrast to other regional areas of the United States that have experienced fast growth and have recently added additional career fire suppression forces or

moved from a volunteer to a combination system and have yet to experience the high legacy costs associated with retirees.

The myriad of language and performance markers that evaluate organizational staffing models of fire departments across the nation is a patchwork of ideas that are based on local interpretation of standards, tradition, contractual language and cost. Little research of best practices to increase the quality of these models is available. The problems associated with the decision making process for fire department funding for career staff causes confusion for fire administrators and elected officials alike. The evaluation of research data through the questionnaire shows that local autonomy often outweighs performance standards such as NFPA 1710 and staffing is based on cost and options that work for the municipality. Demographic questionnaire respondents that protected populations of fewer than 20,000 consistently set staffing levels that fell short of national standards. Even when evaluating data regarding minimum staffing of departments protecting populations of fewer than 50,000 shows that these levels vary widely with little reason beyond EMS service levels provided to their communities.

Areas for cost reduction in the fire department budget are extremely limited as operational costs are only a fraction of overall expenditures. This contrasts sharply with neighboring volunteer agencies that routinely have operational budgets 100% to 400% higher and protect less population. Outside revenue streams continue to be investigated to bring in additional cash to the organization. The department did start a first response emergency medical program in 1995 and now performs catch and release EMS for approximately 70% of its calls. While this does provide substantial call volume for the department in reality most of this work is performed by 2 staff personnel. The department receives no funding for this activity and is at a crucial point as whether to maintain this service or attempt to increase the service level to include

transports, thereby allowing us to tap into the largest revenue source available to the fire service today. With current manpower levels this would require a reorganization of staff and a massive change in the overall mission of the EFD.

Maintaining an adequate response staff is the greatest challenge that is faced by the EFD as we work with a variable number of responders at any given day or time. The reluctance of elected officials to use a constant staffing model and back fill seats with overtime is based on the reality that a realistic minimum staffing number and current per shift staffing are so close that a constant need for overtime would arise. This dilemma points to a real need for the EFD to seek an organizational change that would increase the current per shift staffing by moving from a 4 platoon system to a 3 platoon system. To accommodate the increased number of days that personnel would be required to work the change would also need to be coupled with a demand led initiative that reduced manpower levels in the evenings but still maintained a minimum number of staff. The results would be twofold by the allowing fire department personnel costs to remain relatively the same while addressing the low manpower levels. This change would also create a number of positive advantages for the department by allowing additional freedom in training personnel, providing additional promotional opportunities and having the personnel available to seek new opportunities and increased service levels.

The fire service is a labor intensive profession with little room for error and even less tolerance regarding excessive time for deployment of manpower. The research did show that the EFD is similar to an extraordinarily high number of fire departments across the nation in regards to needing assistance from neighboring fire departments to supplement staffing for multiple alarm incidents. The research also uncovered a large number of departments with demographics very similar to Endicott that were utilizing a combination system to protect their community. As

all of the neighboring departments around EFD's fire district are entirely volunteer staffed the combination concept has been lightly discussed with the labor organization, elected officials and one of the neighboring departments. Moving to a combination system that is categorized as mostly career would provide the department much needed flexibility in meeting demands as well as some financial relief to the municipality. It would also offer some support for the callback system currently in place for the EFD for multiple alarm incidents. The callback for large scale incidents is antiquated, difficult to use and produces mediocre performance results as the number of personnel responding back varies widely from incident to incident and on scene response times can be excessive. Given the proximity to Binghamton University and Broome Community College that offers a degree in Fire Protection Technology it may present an opportunity to incorporate a bunker program to meet the needs for additional staffing. Yet another approach could be to combine or consolidate with the local EMS provider that has some members that are fire trained in other volunteer departments. Any of these options could allow the department to bring in a small cadre of capable volunteers that could provide sufficient augmentation to meet staffing needs.

Minor changes to the current staffing model would only allow the organization to exist in the current state of flux and not enable it to reach out for new opportunities that may arise. Given the current state of the economy even small reductions to the budget by elected officials would result in changes to manpower levels. The resulting change would be manpower levels that would be virtually ineffective in starting initial operations without immediate aid from another agency. Should history repeat itself the agency could be left with losing another large percentage of the workforce over the next 10 years due to increases in legacy costs. Non action that produces this option would be considered a poor approach to solving the problem as the

EFD would have no control over training levels and deployment of personnel that would be responding in from outside agencies. Another drawback to loss of personnel through non action would be the inability to seek out new opportunities that may present themselves.

Through evaluation of the literature and data gathered during this research it is readily apparent that the EFD is not alone in facing a mounting predicament in regards to staffing. The current economic conditions will force fire departments nationwide to consider new ways of deploying their workforce to meet the demands for emergency services. Administrators should also remain poised to examine reduction in services or service levels that affect their overall cost structure. There is little doubt that the pending financial problems are going to have a nationwide effect on fire departments of all sizes. However the silver lining to the economic woes that we are currently experiencing are that it can provide an opportunity to create positive change within the organization. By forcing the EFD to look at service levels, quality and investigation of other revenue sources it breaks the chains that bind us to faults of the current staffing model in place. Regardless of what new components of different staffing models the department may adopt the harsh realization is that they will undoubtedly bring large cultural change to the organization. The buy in needed from the labor union as well as fire department administration and elected officials will likely be the defining factors in regards to the success of new staffing model implementations and organizational changes.

Recommendations

The Endicott Fire Department is at a crossroads in regards to staffing to meet the consistent increase in demands for service. There is little in the way of cost reductions that the fire department can make regarding operational costs and any long term sustainability would

need to incorporate organizational staffing changes to the agency. Without elected officials changing their policy by allowing overtime to staff to a minimum level the department needs to undertake what would be considered drastic change modeling to maintain current levels of service in the future.

The action research has revealed that there are two options that the EFD could take to alleviate its staffing issues while being bound by the financial constraints placed on the department by elected officials. Both scenarios would incorporate moving the department toward a combination system. The first approach would be considered more drastic but allow for increasing current staffing levels so the department to seek out new opportunities in the EMS transport arena.

The first recommended approach would be to address daily and minimum staffing levels through organizational change from a 4 platoon system to a 3 platoon system with demand led staffing incorporated to relieve a subset of personnel during the evening hours from 8 pm to 8 am. The new model (Appendix G) would follow the 24 hours on, 2 days off, 12 hours on, 2 days off cycle. This would immediately provide 3 additional personnel per shift and allow for a 5 man minimum during the evening hours. By off shifting personnel every other in the evening you could still maintain a set minimum and meet the national standard for peak fire and EMS activity from 8 a.m. to 8 p.m… During the evening hours from 8 p.m. to 8 a.m. the on duty shift would be supplemented by limited volunteer forces, possibly through a bunker program to augment staffing.

The second recommended approach would simply slowly incorporate limited volunteer forces into the current system as they are trained to a department set standard. While this option would be less disturbing to the organization as a whole, it limits the EFD in seeking new

opportunities and does not commit the agency to a new overall direction. It simply seeks to limit the exposure to low staffing risks such as increased fire loss and firefighter injury and death by providing staff augmentation through volunteer personnel. The likely outcome over time would be a closer balance between the numbers of career and volunteer staff and a mission focus change for career personnel as their numbers dwindled.

The last recommendation would be to prepare all parties for the cultural change that would be presented to the organization by moving to one of the new staffing models shown. Fire department and elected officials would have to show the benefits of adopting the new staffing model and labor representatives would need to embrace the change process as well. Training would need to be provided to company officers to minimize the effects of the cultural changes and maximize the success rate of the new staffing model.

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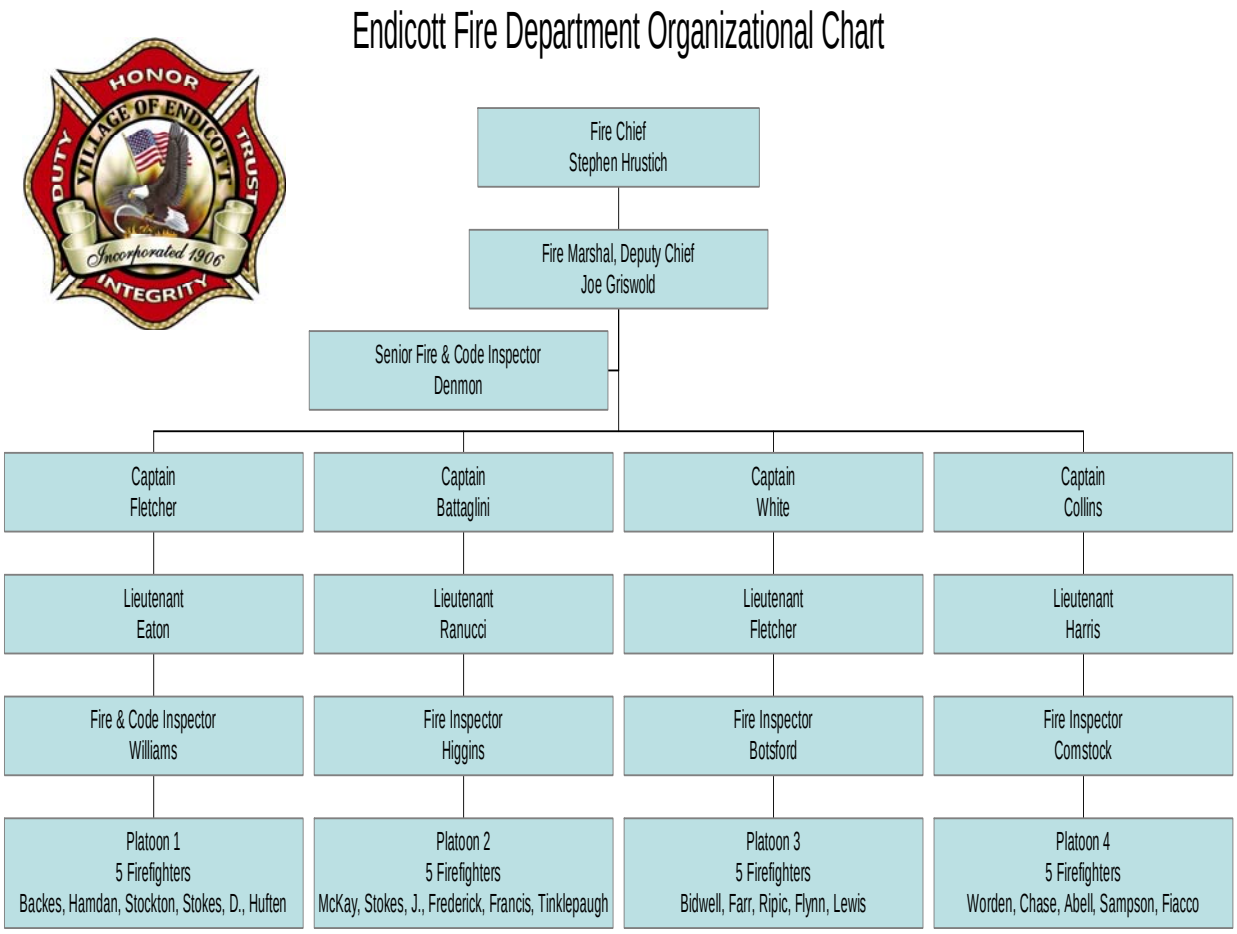
Appendix A


Endicott Fire Department Organizational Chart
Fire Chief
Stephen Hrustich
Fire Marshal, Deputy Chief
Joe Griswold
Senior Fire & Code Inspector
Denmon
Captain
Fletcher
Captain
Battaglini
Captain
White
Captain
Collins
Lieutenant
Eaton
Lieutenant
Ranucci
Lieutenant
Fletcher
Lieutenant
Harris
Fire & Code Inspector
Williams
Fire Inspector
Higgins
Fire Inspector
Botsford
Fire Inspector
Comstock
Platoon 1
5 Firefighters
Backes, Hamdan, Stockton, Stokes, D., Huften
Platoon 2
5 Firefighters
McKay, Stokes, J., Frederick, Francis, Tinklepaugh
Platoon 3
5 Firefighters
Bidwell, Farr, Ripic, Flynn, Lewis
Platoon 4
5 Firefighters
Worden, Chase, Abell, Sampson, Fiacco

Appendix B

ENDICOTT FIRE DEPARTMENT
STANDARD OPERATING PROCEDURES

TO: **ALL PERSONNEL**

SUBJECT: **APPARATUS STAFFING**

BY ORDER OF: **CHIEF Stephen Hrustich**

DATE: **Revised December 18, 2008**

	Eng25-1	Eng25-2	Tower25-6
8	Officer in Charge Driver Firefighter Inspector	Lieutenant or Senior FF Driver	Driver FF/EMS
7	Officer in Charge Lieutenant FF/Driver Firefighter FF or Inspector	Driver FF/EMS	OOS
7 Optional Response	Officer in Charge Driver Lieutenant, FF or Inspector	Driver FF/EMS	Driver FF/EMS
6	Officer in Charge Driver Lieutenant, FF or Inspector FF	Driver FF/EMS	OOS
5	Officer in Charge Driver Lieutenant, FF or Inspector	Driver FF/EMS	OOS
4	Officer in Charge Driver Lieutenant, FF, Inspector (stay in quarters)	OOS	OOS
3	Chief Officer Driver Officer, FF or Inspector (stay in quarters)	OOS	OOS
2	Chief Officer Driver (Officer, FF or Inspector)	OOS	OOS
1	Chief Officer in Command Car All other apparatus OOS	OOS	OOS

Appendix C

V/Endicott		02/24/09	2006-2007	2007-2008	2008-2009	2008-2009	2008-2009	
Budget Worksheet for 2008-2009 FY					Adopted	Mod Budget	Actual at	
Adopted on		Act	Actual	Actual	Budget	1/31/2009	1/31/2009	%
A - GENERAL FUND EXPENDITURES								67.0%
A 3410	Fire Department							
1100	Regular Salaries and Wages		$1,788,166.98	$2,024,714.49	$2,085,656.72	$2,085,657.00	$1,345,600.95	64.5%
1200	Admin Assist - PT wages		$9,978.92	$9,180.10	$10,847.20	$10,847.00	$7,050.66	65.0%
1400	Overtime		$48,506.63	$77,327.60	$80,000.00	$80,000.00	$35,358.59	44.2%
2300	Vehicles - Fire Truck			$389,914.00	$0.00	$0.00	$0.00	0.0%
2430	Wearing Appearal		$13,561.87	$19,192.04	$17,500.00	$17,500.00	$16,855.44	96.3%
2440	Radio Equipment		$2,121.95	$4,589.49	$3,500.00	$3,500.00	$3,451.30	98.6%
2450	Fire Protection Equipment		$9,912.05	$16,865.06	$35,000.00	$38,376.54	$17,250.06	44.9%
2455	Fire Equip - Fed Grant		$102,923.35	$111,396.00	$0.00	$0.00	$0.00	0.0%
4070	Supplies		$2,999.99	$2,969.10	$4,000.00	$4,030.58	$3,997.97	99.2%
4090	Miscellaneous		$904.12	$0.00	$0.00	$0.00	$0.00	0.0%
4205	Computer Maintenance		$4,215.49	$1,009.76	$4,000.00	$4,490.00	$1,450.70	32.3%
4210	Equipment Repair		$12,000.00	$0.00	$0.00	$0.00	$0.00	0.0%
4225	Building Maintenance		$2,681.80	$15,292.20	$15,000.00	$15,000.00	$12,636.68	84.2%
4230	Central Garage		$28,432.23	$20,723.43	$20,000.00	$20,000.00	$8,969.48	44.8%
4240	Heat		$34,361.58	$26,316.32	$25,000.00	$25,000.00	$16,458.95	65.8%
4275	Cleaning Supplies		$3,500.67	$3,490.81	$3,500.00	$3,500.00	$2,052.07	58.6%
4290	Gasoline and Diesel Fuel		$7,023.96	$9,999.54	$14,000.00	$14,000.00	$4,672.72	33.4%
4310	Prop & Liab Ins			$26,935.23	$27,000.00	$27,000.00	$27,000.00	100.0%
4470	Training		$5,144.80	$7,967.63	$10,000.00	$10,065.00	$4,943.14	49.1%
4475	Education - Contractual		$551.70	$2,154.00	$4,000.00	$5,814.00	$3,434.00	59.1%
4476	Education - Public		$1,000.86	$1,079.59	$1,200.00	$1,200.00	$1,199.84	100.0%
4610	Confined Space		$2,190.94	$2,169.08	$2,200.00	$2,200.00	$0.00	0.0%
8310	NYS Emp Ret Sys		$1,062.17	$1,064.58	$730.93	$731.00	$672.76	92.0%
8315	NYS Pol & Fire Ret Sys		$309,915.40	$334,227.11	$340,951.52	$369,235.75	$369,235.75	100.0%
8330	Soc Sec		$141,268.92	$154,919.70	$170,350.50	$170,351.00	$101,925.23	59.8%
8340	Workman Comp		$67,456.16	$174,442.47	$185,780.00	$185,780.00	$38,099.46	20.5%
8355	NYS Disability Ins		$115.02	$266.81	$273.00	$1,323.00	$952.36	72.0%
8360.1	H/Ins - Active		$439,330.27	$427,163.01	$438,679.39	$438,679.00	$317,408.63	72.4%
8360.2	H/Ins - Retiree		$376,228.53	$363,482.56	$372,318.28	$372,319.00	$276,019.86	74.1%
8389.3	Disabled Firemen		$52,815.95	$57,581.16	$50,300.00	$50,300.00	$38,807.77	77.2%
A 3410	Subtotal		$3,468,372.31	$4,286,432.87	$3,921,787.54	$3,956,898.87	$2,655,504.37	67.1%

Appendix D

New York State Career / Combination Fire Departments
With Populations Under 20,000

Name	Population	Median Income	Median Home Value	Type	Career	Volunteer	Paid Per Call
Amsterdam	17,752	38,878	138,462	Career	33	0	0
Arlington	13,011	53,745	291,678	Mostly Volunteer	65	100	0
Beacon	14,548	56,355	273,660	Mostly Volunteer	13	64	0
Canandaigua	11,185	45,501	133,586	Mostly Career	15	21	0
Batavia (City)	15,271	41,224	174,543	Career	41	0	0
Norwich (City)	7,056	35,070	135,530	Mostly Volunteer	17	40	0
Olean (City)	14,286	37,368	76,960	Career	43	0	0
Oneonta (City)	13,225	30,374	164,170	Mostly Career	26	0	20
Rye (City)	15,242	134,680	1,134,242	Mostly Volunteer	17	40	0
Cohoes	15,083	40,567	146,631	Career	40	0	0
Corning	10,321	37,895	92,698	Mostly Career	25	0	10
Cortland	18,382	32,599	160,336	Mostly Career	35	30	0
Dunkirk	12,127	32,954	65,135	Mostly Volunteer	26	35	0
Endicott	12,492	32,417	88,895	Career	32	0	0
Eastchester	19,074	91,229	633,440	Mostly Career	72	12	0
Elma	11,303	65,842	178,032	Career	35	0	0
Fayetteville	4,134	60,477	150,813	Mostly Volunteer	10	43	0
Fulton	11,278	36,078	77,170	Career	38	0	0
Geneva	13,202	38,655	96,255	Mostly Volunteer	18	35	0
Glens Falls	13,968	36,503	158,066	Career	38	0	0
Gloversville	15,031	32,940	118,617	Career	33	0	0
Herkimer	7,028	30,486	144,556	Career	17	0	1
Hornell	8,553	32,582	61,581	Mostly Career	22	0	10

Appendix D (continued)

New York State Career / Combination Fire Departments
With Populations Under 20,000

Name	Population	Median Income	Median Home Value	Type	Career	Volunteer	Paid Per Call
Ilion	8,093	39,142	138,912	Mostly Career	16	12	0
Johnson City	14,824	34,168	84,015	Career	45	0	0
Johnstown	8,446	40,140	141,844	Career	25	0	0
Kenmore	15,123	49,383	104,254	Mostly Volunteer	12	65	0
Lackawanna	17,707	34,308	91,937	Career	48	0	0
LaGrange	15,886	93,287	405,474	Mostly Volunteer	14	50	0
Little Falls	4,911	29,513	121,738	Career	15	0	0
Manlius	4,610	54,374	172,438	Mostly Volunteer	10	45	0
Medina	6,054	37,304	133,501	Mostly Volunteer	7	0	18
Niskayuna	11,875	85,673	190,313	Mostly Volunteer	15	35	0
Ogdensburg	11,168	34,077	61,258	Career	31	0	0
Oneida	10,791	47,173	99,305	Career	24	0	0
Plattsburgh	19,444	36,177	142,512	Career	37	0	0
Rensselaer	7,924	41,161	138,917	Mostly Volunteer	12	45	0
Ridge Culver	11,382	40,902	95,026	Mostly Volunteer	14	30	0
Salamanca	5,630	30,212	53,690	Mostly Career	19	1	0
Scotia	8,076	55,329	141,094	Mostly Volunteer	13	30	0

Appendix D (continued)

New York State Career / Combination Fire Departments
With Populations Under 20,000

Name	Population	Median Income	Median Home Value	Type	Career	Volunteer	Paid Per Call
Tonawonda	14,931	43,856	92,825	Mostly Volunteer	27	36	0
Watervliet	9,832	40,634	149,606	Career	24	0	0

Appendix E

Fire and Medical Response Agency Demographics Questionnaire

Agency Name:

Agency Representative and Title:

1) Population served?

2) Square middles of response area?

3) Type of department (career, combination)?

4) Current size of your department?

5) If combination department, number of career, part time and volunteer personnel?

6) Number of groups, shifts or platoons?

7) Type of shift schedule used (i.e. 24hr/1 on -2 off, 10-14, 8 hr shifts, etc…)?

8) Minimum staffing number (if you have one)?

9) Is the minimum staffing number contractual (if you have one)?

10) How do you meet minimum staffing numbers if you have one (overtime, part time, volunteer)?

11) What is your current fire department budget?

12) What is your budgeted overtime? Do you exceed that amount on an annual basis?

Appendix E (continued)

Fire and Medical Response Agency Demographics Questionnaire

13) Number of personnel assigned to Engine companies?

14) Number of personnel assigned to Ladder companies?

15) Do you provide Emergency Medical Service (EMS)?

16) If yes to #15, what level of service do you provide (First Response, BLS Transport, ALS Transport)?

17) How many trained EMS personnel do you have on staff?

18) What level are these EMS personnel trained to (First Responder, EMT, Paramedic)?

Thank you for participating in this Fire and Medical Response Agency Demographic Questionnaire. The data from this questionnaire will be utilized to evaluate staffing and service models for an applied research project for the Executive Fire Officer program at the National Fire Academy.

Appendix F

Endicott Fire Department
Office of the Fire Chief
1009 East Main St.
Endicott, NY 13760

Phone (607) 757-2463 Fax (607) 757-2469

Date: October, 3, 2008

To: Fire Chief's and Agency Representatives

Re: Fire and EMS Response Agency Demographics Questionnaire

Dear Fire Chief or Agency Representative,

I sincerely appreciate your time and consideration in completing the enclosed Fire and EMS Response Agency Demographics Questionnaire. The results of the questionnaire will be used for an applied research project for the Executive Fire Officer Program at the National Fire Academy.

The questionnaire will give insight into staffing models, service delivery and agency demographics for your organization. This information will be compiled to look at the various staffing models in place across greater New York State. The basis for the research is for the development of a sustainable staffing model for the Endicott Fire Department.

I would again like to thank you for taking the time to complete this questionnaire. Please contact me with any questions you may have at the number listed at the top of this letter.

Sincerely,

Stephen Hrustich

Stephen Hrustich

Fire Chief

Endicott Fire Department

Appendix G

Endicott Fire Department Organizational Model