An Evaluation of the

Aurora Fire Department Staffing

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ABSTRACT

The Aurora Fire Department staffs two fire stations twenty-four hours a day with fourteen full-time and twenty-six part-time employees. The staffing consists of a lieutenant and three firefighters at Station 1 and two firefighters at Station 2. Part-time employees staff two of these positions each day. Two problems exist with the current staffing method. Station 2 is understaffed at two personnel per day and it is difficult to maintain a six-person shift between two stations because of the availability of part-time employees. Staffing often drops to a minimum of five personnel and if necessary overtime is paid to a full-time employee to maintain that minimum.

The purpose of this research project is to evaluate current staffing methods and explore ways to improve and increase staffing that are efficient and cost effective. This project used a combination of historical and evaluative research to answer the following questions:

1. How does the staffing of the Aurora Fire Department compare to national staffing standards and combination fire departments of similar sized cities in our area?
2. What is a safe and cost effective number of firefighters needed to staff the Aurora Fire Department?
3. What is the right combination of full-time and part-time firefighters needed to accomplish the staffing needs of the Aurora Fire Department?

The procedures used in this project included a literature search of current national standards affecting fire department staffing and previous research of staffing in other combination fire departments. A survey was conducted of local area combination

fire departments to compare their staffing to Aurora. Budget and financial records were examined and the finance director of the City of Aurora was consulted to determine future revenue available from a fire department tax levy.

Results from the research showed that the Aurora Fire Department does not staff enough personnel to meet nationally recognized standards for a first alarm response to a structure fire. They currently staff enough personnel to meet the standard for an initial response of four firefighters within five minutes but cannot get the balance of the first alarm assignment to the scene within nine minutes. Fire department reports showed that they were short staffed a total of 1237 hours in 2001, which also reduced the initial response manpower.

Results from the survey showed that the Aurora Fire Department's staffing was above average when compared to other area fire departments. Most of the fire departments with less staffing only had one station and had fewer runs than Aurora. The fire departments with larger staffs had larger populations and more runs than Aurora.

Financial records and information showed that the current combination of part-time and full-time firefighters was a cost effective way to staff the fire department. This method becomes less cost effective as the number of part-time positions per day is increased, because a greater number of part-time employees are needed to draw from to fill those positions. Full-time employees are more expensive but they can cover more hours with fewer employees. Research showed an increase in revenue from the next renewal of the fire department levy could fund three new full-time firefighters.

Recommendations from this research include; hiring three full-time firefighters to staff an additional position per day at Station 2, maintain the current staff of part-time employees to fill two positions per day, and revise the Aurora Fire Department's MABAS boxes to send more apparatus early in the alarm to try to meet nationally recognized response standards.

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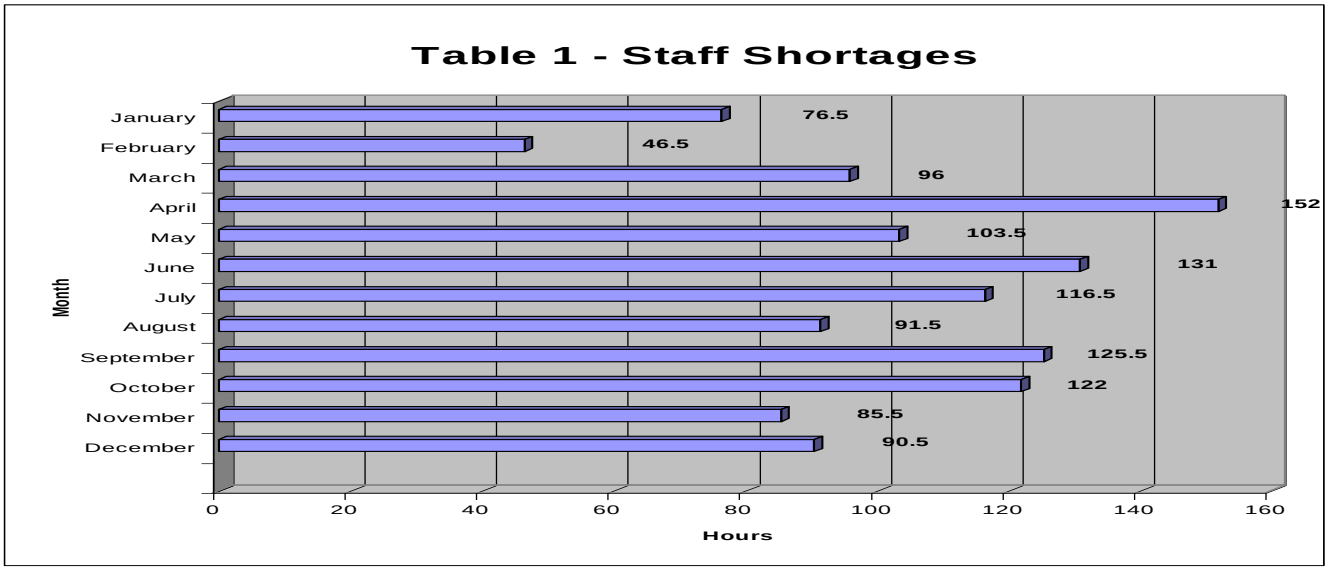
INTRODUCTION

The Aurora Fire Department currently staffs two fire stations with a combination of full-time and part-time personnel. Full strength staffing is currently four personnel at Station 1 and two personnel at Station 2. There is a full-time lieutenant and three full-time firefighter/paramedics assigned to each shift. Part-time personnel staff the remaining positions and any days off for the full-time personnel. The current staff consists of a chief, an assistant chief, three lieutenants, nine full-time firefighter/paramedics, and twenty-six part-time firefighters holding paramedic or EMT certifications.

The problem with the current staffing method is twofold. First, we feel Station 2 is understaffed and we would like to add an additional person per shift. Secondly, we have problems maintaining six men per shift because of the availability of the part-time firefighters. We often drop down to a minimum staff of five and when necessary pay overtime to a full-time firefighter to maintain that minimum. Part-time shifts were short a total of 1237 hours in 2001. Table 1 shows these hours totaled by month occurred.

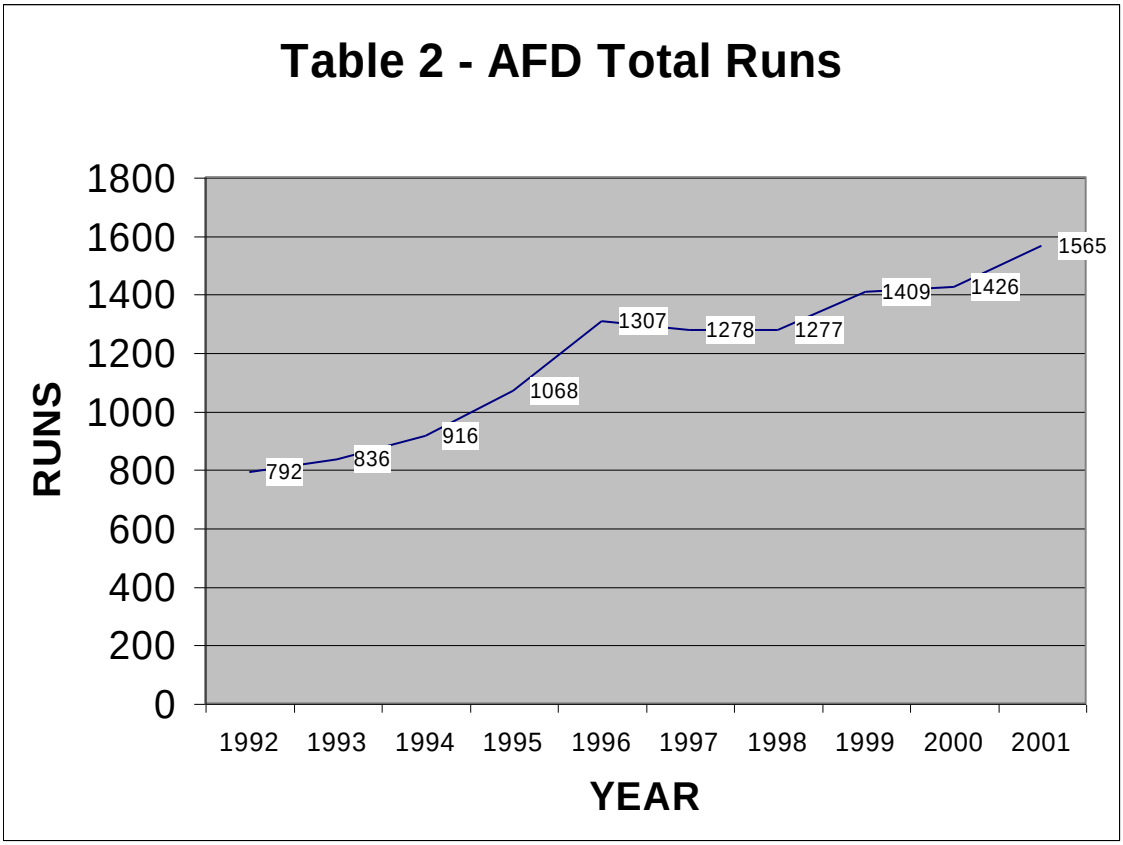


The purpose of this research project is to evaluate our current staffing method and explore ways to improve and increase staffing that are efficient and cost effective. This project will use a combination of historical and evaluative research to answer the following questions:

1. How does the staffing of the Aurora Fire Department compare to national staffing standards and combination fire departments of similar sized cities in our area?
2. What is a safe and cost effective number of firefighters needed to staff the Aurora Fire Department?
3. What is the right combination of full-time and part-time firefighters needed to accomplish the staffing needs of the Aurora Fire Department?

BACKGROUND AND SIGNIFICANCE

The Aurora Fire Department is responsible for fire and emergency medical services for the City of Aurora, Ohio. The City of Aurora is a growing community located in Portage County, approximately twenty-five miles southeast of Cleveland. In the last ten years, the population has increased by five thousand people and our calls have nearly doubled (Table 2). In addition, the city is home to the Six Flags amusement park, that includes the former Sea World animal park and can bring as many as fifty thousand additional people into our city on a busy day.



In the same period, the Aurora Fire Department has increased staffing from a two man per day shift operating out of one station, to a six man per day shift operating out of two stations. In order to staff these positions, we hired six additional full-time firefighter/paramedics. Station 1 manning consists of a lieutenant and three firefighters and Station 2 manning consists of two firefighters. In order to avoid excessive overtime, we will drop to three men at Station 1 if no part-time personnel are available to fill the shift.

We currently have twenty-six part-time employees on our roster, but many times, we are unable to fill shifts because of their availability. Fourteen of our part-time

employees work for other fire departments and the rest work predominantly day shifts at private business or industry. Part-time shift shortages occur mostly during weekday shifts and holidays. In the past, we have added part-time employees to try to cover these shortages. Many of these new employees were young, enthusiastic men and women who aspired to be full-time firefighters. They gained training and experience from our department and used it to achieve their goal. We hired some of them for full-time positions and others achieved full-time positions elsewhere. Some of those stayed on part-time but were now unable to work as many hours. Their full-time jobs often cause them to arrive late or leave early for their shift in Aurora.

Our runs have increased to the point where we no longer feel we can get by dropping down to a five-man shift. When both squads are out at the same time, the only person left on duty may be the lieutenant. When this happens, we call back off duty full-time firefighters but eleven out of twelve have second jobs and may not be available to return in a reasonable amount of time.

Adding an additional person per shift would help correct two staffing problems. It would allow us to staff a third person at Station 2 and would help to maintain a total staff of six per shift in the times when part-time personnel are unable to work. The additional person at Station 2 would increase efficiency and safety on fire runs. A three-man engine enables two firefighters to be ready when they arrive at the scene to attempt a rescue or attack the fire and still have a pump operator with the apparatus. The additional person on squad calls would help the paramedics manage critical patients quickly and without relying on help from Station 1.

The additional person per shift would help maintain a minimum staff of six per shift at the times when we are now working with five. A seven-man shift would allow us to respond to fire calls with two engines and a squad. If a squad were already out, we would still be able to respond with at least one adequately staffed engine. In addition, late arriving or early departing part-time personnel would not cause as much of a scheduling problem as they do now.

The addition of a seventh position per day does not eliminate the need for part-time firefighters. All current part-time staff will continue to staff two positions daily and cover vacations. To replace these two part-time staffed positions with six full-time employees would cost approximately $390,000. The part-time budget for these positions, vacation coverage, and training wages is only $299,000.

Additional personnel need to be hired to staff a seventh position per day. Three full-time firefighters would be needed to staff this additional position working twenty-four hour shifts. If part-time firefighters were used, many more firefighters would need to be hired to draw from to cover those hours. If we are able to increase the full-time staff to fill these three positions, we continue to build a sufficient nucleus of full-time staff supported by the current part-time staff at a reasonable cost to the city.

LITERATURE REVIEW

NFPA (National Fire Protection Association) and OSHA (Occupational Safety and Health Administration) standards applying to fire department manning were researched for comparison. As early as 1993, NFPA attempted address the issue of fire

department manning. Research of their standards found a temporary interim amendment to NFPA 1500, Standard on Fire Department Occupational Safety and Health Programs. The amendment required the assembly of at least four firefighters before initiating interior firefighting operations at a working fire. Although the intent of the amendment was to staff fire engines with four firefighters, it did allow them to arrive on different apparatus and assemble into four man crews after arrival. This allowed smaller paid, combination, and volunteer fire departments to staff their apparatus with fewer personnel and rely on multiple apparatus, volunteer members, or mutual aid departments to assemble a crew.

In May of 1995 a memorandum was issued by the U.S. Department of Labor, in response to an interpretation of an OSHA requirement for workers operating in hazardous atmospheres. Code of Federal Regulations 1910.120 requires workers entering hazardous atmospheres to enter with a “buddy” and have another team of two standing by outside of the hazard as backup. This memorandum written by James W. Stanley, Deputy Assistant Secretary U. S. Department of Labor, became known as the “two in two out” rule. This memorandum references NFPA 1500 and correlates the four persons assembled for interior firefighting to the two in two out rule. Although federal OSHA does not have jurisdiction over state and local government employees, states that have their own OSHA programs such as Ohio must adopt standards that are at least as effective as federal OSHA standards and must provide coverage for state and local government employees as effective as that provided to private sector employees.

In May of 2001 NFPA 1710 and 1720 were passed creating new staffing and response time standards for career and volunteer fire departments to strive for. NFPA

1710 applies to career and paid fire department that regularly staff their stations. NFPA 1720 applies to volunteer fire departments that normally do not staff their stations. The Aurora Fire Department is staffed twenty-four hours a day and would fall under NFPA 1710. NFPA 1710 requires the arrival of four firefighters within five minutes and a full assignment of fourteen to fifteen firefighters to arrive within nine minutes, at the scene of a structure fire (Appendix A). The initial response of four firefighters still may arrive on more than one vehicle, as may the balance of the assignment. The standard also specifies a five-minute response for EMS with a first responder or EMT crew. If your department has paramedic level service, at least two paramedics are required to be on the scene within nine minutes. The goal NFPA 1710 is to meet these response times ninety percent of the time.

In an article by Steve N. Pegram in Fire Rescue Magazine (August 2001) the author discusses the reason to have fourteen to twenty firefighters dispatched to a residential structure fire. The tasks, which should be accomplished simultaneously at the scene, include command, water supply, fire attack, primary search, ventilation, back-up line, and laddering the building; usually require teams of two each. In addition you may need a safety officer and a rapid intervention team on serious fires that are not controlled quickly.

Gary Ludwig discussed the staffing and response requirements for EMS in an article in Firehouse Magazine (July 2001). In addition to meeting the response time requirements, the initial crew must be trained to at least a first responder level and have an AED (Automatic External Defibrillator) on board. If the call is an ALS (Advanced Life Support) call, the minimum crew should consist of at least two EMTs and two

paramedics. Fire departments can use automatic or mutual aid to comply with the standard.

Recent research on the use of part-time staffing was found in an EFO paper by Tom Riemer (1998). His paper was on the use of Extra-Board (part-time) firefighters in the Anderson Township, Ohio Fire Department. These extra-board firefighters are used to supplement the full-time staff instead of paying overtime to maintain minimum staffing. Extra-board firefighters were used only to replace full-time firefighters off for vacation, sick, or other benefit hours, as opposed to other departments that regularly use part-time firefighters as part all or part of their daily staffing. In the first year of implementation this method of staffing saved the fire department over $90,000 in overtime cost. Problems encountered with this system included opposition of the full-time staff and the availability of the extra-board firefighters. The full-time staff felt their jobs were being threatened by the extra-board firefighters and had to be reassured that they were only supplemental to reduce overtime. Riemer recommended a larger pool of extra-board firefighters to draw from because of turnover, availability, and short notice when a full-time employee would call off.

A paper on fire department staffing in Hamilton County, Ohio by Stephen Ashbrock (1996), showed several of the problems the part-time staffing problems encountered by Hamilton County fire departments are the same as the ones encountered by Aurora Fire Department. Ashbrock reported that the number of part-time firefighters in Hamilton County seemed to be too few to meet staffing needs. Ashbrock's survey showed that departments that employed at least twenty-five part-time members needed a ratio of 4.8 firefighters for each daily shift to be filled. This means

that for each daily shift available, at least 4.8 part-time employees were needed to draw from in order to be able to staff that position. He found that as many as twenty-five percent or more of part-time firefighters in smaller suburban departments belonged to multiple departments. This not only reduced their availability but also enabled firefighters to pick and chose shifts at the departments that paid the most. Multiple department membership also reduced the chance of the firefighters being available for call back in case of a large fire or other emergency. Ashbrock reported that several departments were investigating replacing part-time employees with full-time employees as a way to reduce equipment and training costs and to reduce the complexity of scheduling.

PROCEDURES

Although it is obvious to most who work at the Aurora Fire Department that we do not always staff at full strength, I needed to be able to prove how often that it actually occurred. Payroll records, lieutenant's monthly reports, and station logbooks were reviewed to determine the hours that were not staffed. Employee timesheets showed how many hours were worked but often did not specify if they were on duty, responded from home to fill the station, or were at the station for training. Since January of 2001, lieutenants were required to list all staff shortages in their monthly reports so the mayor and city council would see these statistics. These reports were the most accurate tabulation of hours that were not staffed.

In order to compare our staffing to other area combination fire departments, a survey (Appendix B) was developed and sent out to twenty-one area departments. These departments were selected because their location in proximity to Aurora and similarities of employee composition, run volume, or community population. Experience from union negotiations has shown that politicians in our community need comparisons to communities they know and can relate to Aurora. Twenty surveys were returned and one was not included because the department had no full-time employees. Most surveys were returned by fax or e-mail and phone calls were placed to clarify some of the data received. The survey information was charted for comparison.

Budget and financial records were examined to determine costs for employees and funding methods. The finance director for the City of Aurora was consulted to determine future revenues available from a fire department levy. Five-year plans showing distribution of funds and budget projections were very useful.

Definitions

Automatic-Aid – Responding apparatus from other fire departments are dispatched as soon as an alarm is received according to established guidelines.

EMS – Emergency Medical Service

Engine Company – A crew of firefighters assigned to respond on a fire engine

Full-time firefighter – An employee hired to respond to fire and EMS calls who receives salary and benefits and works at least 2080 hours per year.

MABAS – Mutual Aid Box Alarm System – Pre-determined mutual aid responses for large fire and disaster situations.

Mutual Aid – Rendering assistance to other municipalities or fire departments when requested.

NFPA – National Fire Protection Association – Non-profit organization that develops fire, electrical and other life safety standards.

OSHA – Occupational Safety and Health Administration – Federal agency that regulates workplace safety and health rules.

Part-time firefighter – An employee hired to respond to fire and EMS calls who works less than fifty-two hours per week and does not receive benefits.

Squad – A vehicle used to transport ill or injured persons

RESULTS

The Aurora Fire Department cannot now and is not likely in the near future, to meet all the standards contained in NFPA 1710. We will be able to arrive at the scene of a working fire with six members within five minutes ninety percent of the time. However, even with automatic mutual aid and MABAS boxes, we will not be able to have the balance of the first alarm assignment arrive within nine minutes ninety percent of the time. To staff this kind of manpower ourselves would be cost prohibitive and unrealistic for approximately ten working fires we respond to each year in our city. Normal delays between municipal dispatch centers and travel distances between communities, keep automatic aid and MABAS apparatus and manpower from reaching our calls within the nine-minute time frame. Staffing of mutual aid apparatus may not always be at full strength and more apparatus may be needed to obtain the desired manpower. Our department may be able to achieve the recommended manpower by redesigning the

MABAS boxes to include more apparatus in the initial response or by having the incident commanders call for multiple alarms sooner.

When comparing the staffing of the Aurora Fire Department to other combination departments in our area, the survey showed our staffing was above average. The average minimum staffing was 3.79 compared to our minimum of five and the average maximum staffing was 5.26 compared to our maximum of six. We were above average in the categories of full-time employees and total employees and only slightly below average for part-time employees. The population of our city and our run totals were also above the average, which is consistent with other fire departments with larger staff (See Appendix C).

Our current staffing method of a combination of full-time and part-time employees is cost effective. If full-time employees replaced the two positions per day currently staffed by part-time employees, it would cost an additional $91,650 per year for six full-time employees. However, when a third position per day is added to the staff, the cost of using full-time employees is only an additional $22,425 per year. This cost is based on three full-time employees ($195,273-Appendix D) versus thirteen part-time employees ($172,848-Appendix E) needed to cover these additional hours would have to increase significantly. Currently we use twenty-six part-time employees to staff two positions per day. These two positions usually require two part-time employees each per day to staff. Employees may work the entire twenty-four hour shift but because of their full-time jobs this usually occurs only on weekends. Using four part-time employees per day from a staff of twenty-six, is a ratio of 6.5 for each daily shift. Applying this ratio to staff an additional position per day would require an additional

thirteen part-time employees to staff an additional 8760 hours per year. Staffing this position with a full-time employee although more expensive (Appendix D), makes scheduling easier and the hours are covered by only three employees. Full-time employees cover an average of 2912 hours each per year and don't have to arrive late or leave early to accommodate their full-time job. The reason the cost of full-time is reduced when adding the additional position is because of the initial cost of turnout gear, physicals, and uniforms and the continual cost of some benefits for a greater number of part-time employees (Appendix E).

Reviewing budget plans and consulting the city's finance director supplied the necessary financial information to compare full-time and part-time employee costs. The Aurora Fire Department currently receives funding from the city's general fund and a dedicated fire levy. The current general fund budget is $1.7 million and the fire levy generates approximately $450,000 per year. The fire levy is 1.3 mils and runs for five years. The current levy expires on December 31, 2002 and has never been defeated when placed on the ballot for renewal. Based on the increasing tax base the finance director projects the 2003 levy will generate approximately $650,000 per year. The additional $200,000 could be used to pay the salaries of three additional full-time employees to staff an additional position per day.

DISCUSSION

NFPA 1710 was developed to improve firefighter safety with appropriately staffed fire apparatus and timely responses to alarms. Tests have shown a fire doubles in size

every thirty seconds and responding quickly with enough manpower to effectively fight the fire before it gets out of control is the objective of this standard. Although NFPA standards are only guidelines and not law or requirements, many fire chiefs and municipal officials will choose to ignore them and use cost for their reason. In an editorial by Bill Manning in Fire Engineering (August 2001), the author is very critical of fire chiefs and politicians for short staffing fire apparatus and points out that just as many firefighters are killed and injured today as there were twenty-five years ago.

Chief Ashbrock (1986) cited a Dallas Fire Department study that compared the efficiency of a four-man engine company versus a three-man engine company. The study found that a four-man company could rescue a victim eighty percent faster than a three-man company. Our two-man engine at Station 2 can only have one firefighter wearing an SCBA when they arrive at the scene and cannot perform a rescue or start an interior fire attack without abandoning the pump.

Like many other standards and mandates from government, these standards do not come with funding. Unions will try to use these standards to try to negotiate minimum manning clauses into their contracts and cities will continue to complain about the cost. If a firefighter is killed or seriously injured at a fire scene and their fire department was not complying with 1710, lawyers may use this standard against that department and it's municipality. Aurora Fire Department will have to rely on automatic and mutual aid to deploy enough manpower to comply with this standard. We still must try to staff enough people for an initial response that provides a quick and safe initial fire attack or rescue crew.

The survey that compared the staffing of the Aurora Fire Department to similar area combination departments reveled surprising results. I anticipated that our staffing levels would be lower than average but the survey proved we were above average. The average minimum staffing was 3.79 and the average maximum staffing was 5.26. Our minimum staffing is five and the maximum is six. As expected the departments with higher levels of staffing generally had a larger population or more runs. Two used more full-time staff, one used more part-time staff, and one staffed less than average.

We ranked fifth in number of runs and the departments with more runs either had a higher population or large industrial parks, which increased their daytime population. Run numbers can be deceiving depending on the method used to compile them. Some departments count every piece of apparatus that responds to a call as a separate run. Some departments count training and inspections as runs. Our run totals reflect one incident per number including motor vehicle crashes with multiple victims.

The Hamilton County staffing study by Chief Ashbrock (1996) contained some of the same concerns about part-time staffing as I have stated. Multiple department membership and overall availability caused departments to carry large numbers of part-timers on their rosters to staff their daily shifts. Some departments reported as many as eighty-two part-time employees were needed to cover ten part-time shifts per day. Ashbrock questioned if these shifts could be more efficiently staffed by a fewer number of full-time employees. Many part-time employees are testing to become full-time firefighters and will lose or reduce their availability to work part-time when hired full-time. Ashbrock reported many departments limit their part-time employees to 1500 hours per year to avoid paying benefits under federal rules. Our part-time employees are limited to

106 hours in a two-week pay period to avoid paying overtime as requires by the Fair Labor Standards Act.

Another concern is fourteen of our twenty-six part-time employees belong to other fire departments. If there is an emergency or they are needed for overtime, they call off at our department causing us to run short or pay overtime. The IAFF currently has a policy against union members working or volunteering at another union fire department. Most of these employees are union members and if our full-time employees would choose to file a complaint, we could loose all fourteen at once. The rest of the part-time staff could not cover all the available hours and much of it would have to be covered by overtime.

Hiring three additional full-time employees to staff a seventh position per day would help to solve most of our staffing problems. The1237 hours that we were short staffed in 2001can be covered easily by the new full-time employees. Full-time employees are able to cover 2912 hours per year each minus vacation, holidays, and sick time. Part-time employees can only cover a maximum of 1500 hours per year without being eligible for benefits afforded to full-time employees. Part-time employees are obligated to their full-time jobs and we must schedule them around those jobs and any family requirements. Full-time employees are obligated to report to work on time, for the full shift or longer if needed. These additional employees would keep our staffing at six more often and enable Station 2 to have a three-man engine company most of the time.

The cost of these full-time employees may be higher, but the benefit of their availability and the number of hours they can cover makes scheduling much easier. The

estimated cost to hire an additional three full-time employees is approximately $195,273. The estimated cost to hire additional thirteen part-time employees and staff three positions per day would be approximately $172,848. Part-time employees will still be needed to cover all of the hours currently available to them and to cover time off for the new full-time employees.

Training for full-time and part-time firefighters can differ greatly. New full-time employees are required to be paramedics when hired and remain certified throughout their career. Part-time employees are only required to have basic EMT certification. Full-time firefighters are required to complete 240 hours of basic fire training within one year of appointment. Part-time firefighters are only required to have 120 hours of basic fire training. In addition, full-time firefighters usually receive more additional training than part-time firefighters because they have more opportunity to attend training on duty while the part-time firefighters are at their full-time jobs. Full-time employees are often compensated with overtime or time off for attending additional training, creating an incentive not available to part-time employees.

The service provided by the Aurora Fire Department to the people who live, work and visit the City of Aurora is essential to their safety. It is the responsibility of fire department administrators and city government to provide this service as efficiently and cost effectively as possible. The rescue squad is often diverted from the closest hospitals to those with open beds, sometimes as far away as Akron. The additional time to transport patients to these hospitals increases the chance of simultaneous calls requiring more manpower. The number of firefighters needed to fight a structure fire contained in NFPA 1710 is based on a 2000 square foot single family dwelling without a

basement. Most of the houses in Aurora far exceed that size and range in price from $200,000 to $1,000,000. In 2000, the Aurora Fire Department responded to a structure fire caused by a ruptured gas line. That structure required mutual aid from ten other fire departments to summon enough manpower to fight the fire. This structure was a single family dwelling of approximately 5000 square feet that resulted in a fire loss of $1,200,000. The initial response of six firefighters was just enough to keep the fire from spreading to other structures until help arrived.

RECOMMENDATIONS

The most effective way to maintain adequate staffing at the Aurora Fire Department is to hire an additional three full-time firefighter paramedics. Although the cost is greater than hiring more part-time firefighters, they can cover more hours consistently with fewer employees. Research showed an additional $200,000 would be generated from the fire levy in 2003. This amount will fund the initial cost of the three full-time employees and is projected to increase over the five-year term providing for wage and benefit increases. This staff increase will provide five full-time firefighter/paramedics on each shift and if necessary they could operate from two stations, even if no part-time firefighters were available.

These additional employees will be used to add an additional person to each shift at Station 2 increasing our daily shift strength from six to seven. This will enable Station 2 to run a three-man engine and keep the staffing level at six more often when part-

timers are not available. Scheduling will be less complicated because part-time employees who arrive late or leave early could be scheduled at either station. The current staff of twenty-six part-time employees should be maintained to cover existing shifts and time off for the three new employees. To replace these employees at this time would cost an additional $390,546. Many of these employees have a long history of service to the department and should not be simply cast aside. The general fund budget currently provides $299,000 for part-time employees and will only need to increase as wages increase. No increase is anticipated to cover the time off for the three new full-time employees because 1237 hours cannot be staffed currently.

In order to meet first alarm response times and manpower standards contained in NFPA 1710, I recommend the Aurora Fire Department revise its MABAS boxes. If an additional engine company is added to the first alarm, the increased manpower could arrive faster and be available if needed. Normally only one engine from a surrounding community is called on a first alarm for a working fire. Most engines arrive with a four crew of four and with a full shift on duty we would have fourteen to fifteen firefighters on the scene with two mutual aid engines.

Fire chiefs I know in other communities have spoken of similar staffing problems. The research survey showed communities with higher run numbers have compensated by hiring more full-time or a large number of part-time employees. Firefighters in surrounding communities are often anxious to be involved when a neighboring community has a fire. Involving other departments in these alarms strengthens working relationships and builds teamwork between the departments.

Inter-department training can help to build teamwork faster and work out any problems before they occur on the fire-ground.

Fire department staffing is an issue that affects every community whether they have volunteer or totally full-time staffing. NFPA standards are a helpful way for fire departments to measure their staffing to specific nationally recognized goal. When staffing shortages occur, they must be documented to help the department to provide statistics to support their claim. Until 2001, the Aurora Fire Department did not document short-staffed hours. Everyone in the department knew that we are unable to staff all available hours but the documentation did not exist to prove it. In 2001, the shift lieutenants recorded staff shortages providing statistics for comparison that were used in this research.

The finance department of the City of Aurora was a valuable source of information for funding and cost comparisons used in this research. The finance director provided information about fire levy funding, which was not available from any published information within the city. Wage and benefit information for employees was also easily obtained and contained all the percentages and costs needed to calculate the benefits. Anyone attempting to research these things for their department can save time and effort by using these resources.

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APPENDIX A

NFPA 1710

Full Alarm Assignment

1 – Incident Commander

1 – Chief's Aide

2 – Pump Operators

2 – Attack line

2 – Back-up line

2 – Search & Rescue

2 – Ventilation

2 – Rapid Intervention

1 – Aerial Operator

15 – Total

*Additional Personnel that may be necessary

1 – Safety Officer

2 – Additional Rapid Intervention

1 – Support for each hand-line

Appendix B

Manpower Survey

1. What is the approximate population of your community or district? _____
2. How many combined fire and E.M.S. runs did you have in 2001? _____
3. How many stations do you have? _____
4. How many full-time firefighters do you employ? (all ranks) _____
5. How many part-time firefighters do you employ? _____
6. What is your maximum daily shift strength? _____
7. What is your minimum daily shift strength? _____
8. Do you pay full-time firefighters overtime to maintain this? _____
9. Do part-time firefighters have a monthly minimum # of Hours? _____
10. What is the average hours/week a full-time firefighter works? _____
11. How many full-time employees are assigned to fire prevention or public education as their primary duty? _____
12. How many full-time employees are administrative? (Chief, A.C.) _____

Fire Department Name: Telephone #:

_____ _____

Appendix C

Staffing Survey Results

Department	Population	Runs	FTE	PTE	Total FF	Min. Shift	Max. Shift	FTE-Admin. /Prev.
Mayfield Village	4000	874	7	23	30	4	4	1
Rootstown	7000	822	4	25	29	2	2	1
Independence	7100	2125	24	8	32	5	7	3
Kirtland	7500	1052	10	40	50	4	5	1
Highland Heights	8000	1600	18	12	30	4	5	3
Brimfield	8500	932	4	27	31	2	3	1
Ravenna Twp.	9900	1150	4	36	40	4	5	0
Macedonia	10000	1400	12	18	30	3	4	3
Richmond Heights	10000	1174	15	15	30	4	6	1
Bath Twp.	10000	1281	9	49	58	2	4	4
Mantua	12000	1153	7	23	30	2	4	1
Brecksville	12849	1281	15	21	36	4	5	1
Aurora	14000	1565	14	26	40	5	6	2
Copley Twp.	14000	1818	13	40	53	4	8	3
Streetsboro	15300	1397	3	32	35	5	6	3
Tallmadge	16000	1847	11	45	56	5	6	2
Concord Twp.	17000	1477	11	41	52	5	7	2
Franklin Twp.	17000	1715	14	11	25	2	4	2
Twinsburg	19500	2161	30	18	48	6	9	5
TOTALS	219649	26824	225	510	735	72	100	39
Average	11560	1412	11.84	26.84	38.68	3.79	5.26	2

APPENDIX D

First Year Full-time Firefighter Cost

BENEFIT		COST
WAGES		$39,755.00
PENSION		$5,386.80
MEDICARE		$576.45
WORKER'S COMP		$1,590.20
HOSPITALIZATION		$12,600.00
DENTAL		$1,600.00
VISION		$400.00
LIFE INSURANCE		$200.00
	TOTAL	$62,108.45
ADDITIONAL COSTS		
PHYSICAL EXAM		$633.00
POLYGRAPH		$50.00
TURNOUT GEAR		$1,300.00
UNIFORMS		$1,000.00
	TOTAL	$2,983.00
GRAND	**TOTAL**	**$65,091.45**

APPENDIX E

First Year Part-time Firefighter Cost

Benefit		Cost
Avg. Wages		$10,219.00
FICA		$633.57
Medicare		$148.17
Worker's Comp		$408.76
Life Insurance		$86.53
	Total	$11,496.03
ADDITIONAL COSTS		
Physical Exam		$200.00
Polygraph		$50.00
Turnout Gear		$1,300.00
Uniforms		$250.00
	Total	$1,800.00
Grand Total		**13296.03**