

INCREASED MANNING LEVELS
FOR THE
JOHNSTOWN FIRE DEPARTMENT
VIA
AMBULANCE RECIEPTS

STRATEGIC MANAGEMENT OF CHANGE

BY: Art Martynuska
Johnstown Fire Department
Johnstown, Pennsylvania

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ABSTRACT

The purpose of this research paper was to determine the feasibility of funding and maintaining additional staffing for fire suppression in the Johnstown Fire Department via the use of emergency Medical transport receipts. The problem was that a declining tax base and stagnant economy could not provide enough revenue to increase staffing to recognized levels for safe operations.

Historical and evaluative research methodology were employed to answer the following research question:

1. How much would start-up cost be to provide transport services?
2. How much revenue could be reasonably generated from transport services?
3. Could staff levels be increased with revenues generated from transport services?
4. After start-up costs have been met would revenues be sufficient to increase manning levels above the level needed to staff the EMS program alone?

The procedures employed for this project were a review of relevant literature, a review of historical response information, an application of two costing formulas and interviews of several persons. Data was also obtained from the Cambria County Department of Emergency Services and the Johnstown Fire Department's computerized reporting system. Additional information was gleaned through the International Association of Fire Fighters.

The findings clearly indicated not only the need to increase staffing, but also the very real possibility of funding those increases via the use of emergency medical transport receipts. It was recommended that the City of Johnstown Fire Department undertake emergency medical transport services as quickly as possible.

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INTRODUCTION

There has been little or no information available regarding the possibility of increasing staffing levels in career fire departments with ambulance transport receipts. Additional manning increases have almost always met with resistance due to the added burden placed on the tax paying citizen. Increases in staffing could possibly lead to lower fire-ground injuries and allow the Johnstown Fire Department to meet the dual criteria of efficiency and effectiveness.

The purpose of this research paper was to determine if staffing levels could be increased utilizing additional revenues generated from emergency medical transport billing. In conducting this research an extensive literature review was conducted, historical data related to past medical transports in the City of Johnstown was reviewed, cost assumptions and calculations were done and oral interviews were conducted to answer the following research questions:

1. How much would the start-up costs be to provide transport services?
2. How much revenue could be generated from EMS transport services?
3. Could the staffing levels be increased with the revenues generated from transport services?
4. After startup costs have been met would revenues be sufficient to sustain increased manning levels above the level needed to staff the EMS program alone?

BACKGROUND AND SIGNIFICANCE

Johnstown

The City of Johnstown Pennsylvania lies approximately 60 miles east of Pittsburgh, and approximately 237 miles west of Philadelphia. The city is the largest community in Cambria County and the only municipality with a career fire department.

The City of Johnstown can best be described as a city floundering with financial woes. The resident population of 28,134 people has an average income \$20,277.00 per year. This figure is \$6178.00 less than the rest of Cambria County and \$14,579.00 less than the average yearly income for the state of Pennsylvania. The unemployment level in the city for 1996 was 10.4 percent compared to Cambria County with an unemployment rate of 7.4 percent and the state with a rate of 4.5 percent (Cambria County Planning Commission, 1997).

Currently emergency medical services, (EMS) in the city are provided by two non-profit ambulance companies. The city is divided into two, the east side of the community protected by Seventh Ward Ambulance Service, (7th Ward) and the west side afforded coverage by West End Ambulance Service, (WEAS). (See Map Appendix A.)

The EMS companies are both dispatched by the Cambria County Department of Emergency Service through an enhanced 911 system. According to statistics provided by the 911 dispatching center 7th Ward responded to 4,983 calls in 1997 and WEAS responded to 4,577 calls in 1997. (See Appendix B). The type of assistance required further breaks down these calls.

Since 1993 the Johnstown Fire Department has provided a Quick Response Medical Service (QRS) to supplement the two transport services in the city. Of the 41 members

of the department 39 were trained to the First Responder level. The First Responder is the lowest level of emergency medical training offered by the Pennsylvania Department of Health. Currently the Johnstown Fire Department has a compliment of nine First Responders, 24 Emergency Medical Technicians and six Paramedics. The QRS service also responds with East Hills Ambulance outside the city limits to Lorain Borough.

In 1997 the Johnstown Fire Department QRS service responded to 593 requests for assistance. These requests were done automatically on 556 calls and by request on 37 calls. The fire department is automatically dispatched on six types of medical emergencies, they are; cardiac arrest, choking, drowning, electrocution, man down, and unconscious person. The fire department will also respond to any other type of medical call by request of any ambulance service. In addition, if the resources of either ambulance service are exhausted the fire department will respond with the next available ambulance service to render assistance.

The two ambulance services in the City of Johnstown are staffed primarily with part-time employees and a small core of full time employees. Each service provides both advanced life support (ALS) and basic life support (BLS) levels of care. Both companies utilize wheelchair vans to provide non-emergency transport. Wheelchair transports are arranged in advance for non-emergency, non-bedridden clients.

FIRE DEPARTMENT

The Johnstown Fire Department was formed by Special Ordinance 707 on April 24, 1906. The formal department was formed on May 6, 1906. Initially a retired Battalion Chief from New York City by the name of Thomas F. Freel organized the department.

The city bought nine stations and equipment from the various volunteers along with any outstanding debts that the volunteers may have had. The Assistance Fire Company on Washington Street became Engine Company One, Millville Fire Company on Iron Street became Engine Company Two, Moxham Fire Company on Central Avenue became Engine Company Three, the Seventh Ward Fire Company on Horner Street became Engine Company Four, the Morrellville Fire Company on Fairfield Avenue became Engine Company Five, the Conemaugh Fire Company on Railroad Street became Engine Company Six, the Goodwill Hose, Hook and Ladder Company at Vine and Franklin Street became Truck Company One, the Eighth Ward Fire Company on Franklin Street became Chemical Hose Company one, which later became known as Engine Company Eight and the Friendship Fire Company located on Cooper Avenue became Chemical Hose Company Two, which later closed (E. Musselman, personal communication November 20, 1998).

By 1909 the Johnstown Fire Department consisted of nine stations, 66 men, 36 horses, seven steam fire engines, four hose wagons, five combination chemical and hose wagons, one 65 foot aerial truck, one chief's wagon, 14,100 feet of hose and 333 feet of ground ladders (Johnstown Fire Report, 1993)

In the 87-year history of the Johnstown Fire Department there have been many changes in equipment, manpower and stations. The all-time manpower high was seen in 1968 with 106 men down to the all-time low staffing level of 41 seen today. The nine stations with sixteen manned pieces of apparatus have dwindled to today's census of three stations with three manned pieces of apparatus.

The Johnstown Fire Department currently has a four-platoon system shift in place. Each platoon works three ten hour shifts beginning at seven a.m. and concluding at five p.m.. The ten hour shifts are followed by three days off which is proceeded by three fourteen hour night shifts. This work schedule averages 42 hours per a twelve-week cycle. Maximum staffing is ten fire fighters per shift, but because of contractual concessions agreed to in recent years that number may fall to a low of eight fire fighters.

Typical staffing for a full compliment shift is one Assistant Chief, and three engine companies with one officer and two fire fighters on each piece of apparatus. The three engine companies are distributed throughout the city as follows; Engine Company 1, central business district, Engine Company 2, West Side of town and Engine Company 3, East Side of town. During periods of vacation one engine company may be manned with two members. Additionally, during periods of dual vacations, injury, illness or personal days the Assistant Chiefs will be detailed from their normal command positions to cover the vacancy created. In addition to lowering the staffing levels this situation also leads to a break down in command and a delay in establishing on-scene command as quickly as possible. The incident command system, which has been adopted by the Johnstown Fire Department, is severely hampered by the delay in establishing on-scene command and control.

As manning levels have decreased the demand for services placed upon the Johnstown Fire Department have increased dramatically. In 1990 the department responded to less than 1,000 calls for assistance, this number swelled to over 2,300 responses in 1997 (G. Shiley, personal communication September 10, 1998). The numbers of emergency

medical and public service calls have proven to be the leading causes in the increased response rate (Appendix, C).

Additional revenues generated by emergency medical transport could possibly alleviate the manpower shortages now being experienced by the Johnstown Fire Department. Increases in staffing could also increase fire-ground effectiveness, efficiency and safety.

EVALUATION AND FEASIBILITY STUDY

In 1992 the City of Johnstown filed for distressed status under Pennsylvania Act 47, commonly referred to as the, 'Distressed Cities Act.' Under the auspices of this act a recovery plan for economic revitalization was drafted. Included in this plan is a recommendation that the City of Johnstown under take a serious examination of augmentation of the career fire fighting force with volunteers. The recovery plan also advocated that the city undertake a study to make recommendations for better operations of the fire department. To fulfil the requirements of the recovery plan the city retained the services of the Emergency Services Consulting Group (ESCG) of West Linn, Oregon. The goal of ESCG was to analyze and evaluate the current operation of the city of Johnstown Fire Department. ESCG was also to prepare a feasibility study and implementation plan for possible merger, consolidation or contracting of services for the city of Johnstown, the Westmont Volunteer Fire Department and possibly other surrounding agencies in the future (Emergency Services Consulting Group, 1998).

The feasibility study contained several recommendations for improvements. Included in these recommendations is the development of an EMS component expansion plan for the future of the greater Johnstown area. In addition to this general recommendation the

feasibility study calls for careful consideration to be given to creating a contingency plan for Emergency Medical Service above and beyond current service levels that are currently provided by the Johnstown Fire Department.

This research paper was prepared to satisfy the requirements for the applied research project associated with the Strategic Management of Change Course (SMOC), of the Executive Fire Officer Program at the National Fire Academy. This research paper relates to the specific section of the SMOC course dealing with evaluating costs associated with change.

LITERATURE REVIEW

Safety and Minimum Staffing

The National Fire Protection Association (NFPA) 1987 edition of standard 1500 recommended that a minimum staffing level of four fire fighters be maintained on or arriving with each engine company and ladder company. In high-risk areas the recommended staffing levels should be increased to five on an engine company and six on a ladder company (NFPA, 1987). Unfortunately this staffing “recommendation” was included in the non-mandatory appendix of the standard.

According to section 6-4.1.1 of the 1992 edition of the (NFPA) Fire Department Occupational Safety and Health Program at least four members shall be assembled before initiating interior fire fighting operations at a working structural fire (NFPA, 1996). Additionally, the NFPA reports that in 1997 the leading cause of fire ground injuries were overexertion and strain, which accounted for 24.6 percent of all fire ground injuries (NFPA, 1998). The most recent NFPA safety survey indicated that the northeast had the

highest fire ground injury rate at 4.7 injuries per 100 fires; this was more than twice the rate for the rest of the country.

In 1997 the Occupational Health and Safety Administration (OSHA) issued their respiratory protection regulation, 29 Code of Federal Regulation 1910.134, or the, “two in, two out rule” which requires a mandatory four fire fighters to be assembled before interior fire fighting operations can commence. The only exception to this rule is for situations of imminent life threat to the inhabitants of buildings involved in fire. In essence what this rule dictates is that there has to be a stand-by rescue team in place fully prepared to enter the burning building to affect a rescue of the initial entry team (Baltic, 1998).

In 1994 the Providence Rhode Island Fire Department conducted a staffing study to determine the reduction in injuries, time loss injuries and the time loss associated with three versus four person engine companies. During the study period staffing was increased from three persons to four persons. In that study there was a 23.8% reduction in injuries, a 25% reduction in time lost injuries and a 71% decrease in time lost due to injury when compared to three people staffing. Varone also cited similar studies in Seattle and Dallas which showed marked improvement in engine company efficiency when staffing was increased (Varone, 1994).

The subject of increased safety for fire fighters by increasing staffing has not received much study. Aside from the NFPA’s recommendations and the writings of Mr. Varone most authors concern themselves with addressing the effectiveness of fire fighting operations by increasing staffing levels. This probably coincides with the Insurance Services Organization (ISO) and the grading schedule applied by them in determining a

communities fire insurance rates. The predecessor to the ISO the American Insurance Association (AIA) published a table listing the required strength of fire companies.

This table reproduced below is as it appeared in the 1967 edition of the text Municipal Fire Administration.

The staffing recommendations listed in the table reflected the need for additional staffing in those units that respond to alarms in high value districts. The recommendation for additional manpower reflected the AIA concern for significant fire losses in the highly insured commercial areas of the community. There is no indication in the text that fire fighter safety would increase with the increased manpower.

Fire Companies	Required Strength
High-value companies (first alarm response to high Value districts)	
Pumper company.....	7
Hose company.....	6
Aerial ladder company.....	7
Service ladder company.....	8
Pumper-ladder company.....	10
Other companies (in other districts)	
Pumper company.....	5
Hose company.....	4
Aerial ladder company.....	6
Service ladder company.....	6
Pumper ladder company.....	8
Pumper company with extra ladder equipment.....	7

Table 1

As stated in the text Managing Fire Services increasing staffing levels significantly increases individual company effectiveness (John A. Granito and John M. Dionne, 1988).

As was stated earlier very little attention has been given to increased fire fighter safety with increased manning. After the publication of the NFPA standard 1500 as amended in

1992 to include the tentative interim amendment for staffing there was considerable opposition presented by the International Association of Fire Chiefs (IAFC). The IAFC took the position that the issue of staffing is left up to the individual communities (Halsey & Briese, 1992). The IAFC position was that local conditions had to be taken into account in determining appropriate staffing levels, that there were a variety of factors that collectively exerted a greater influence over fire fighter safety than staffing. Erwin, in 1993, similarly wrote against a nationally recognized minimum-staffing standard. Focusing on the reduction of fire fighters deaths, Erwin argued that better codes and safer buildings helped lessen the likelihood that fire fighter would be injured or killed (Erwin, 1993).

Conversely, the IAFC, in their 1993 text, Improving Fire Department Emergency Medical Services, stated that the high demand for EMS service suggest it may be feasible to establish higher fire fighter staffing levels on fire apparatus based on realistic field demonstrated appraisal of manpower requirements for managing EMS incidents (IAFC, 1993).

In addition to increasing staffing levels several other benefits have been cited for utilizing fire based EMS systems. The IAFC mentioned several advantages to fire based EMS over private companies, these include, existing trained manpower, proximity and access to the public via fire station location, in-place emergency communications, command and control structure, administrative and managerial support and existing public relations and public education programs. At least one researcher theorized that utilizing paramedic engine companies could help reduce instances of burnout by rotating employees between fire engines and ambulances (Fiero, 1990).

Costing Out EMS

Very little has been written on the subject on the cost of providing EMS. In 1994 the International Association of Fire Fighters (IAFF) developed a proposal for the provision of comprehensive medical services for the Scranton, Pennsylvania Fire Department. This implementation model would allow the Scranton Fire Department to introduce transport services as well as increase staffing on eight fire engines. This new manning level would increase fire ground staffing by 20 percent, and increase initial engine staffing by 33 percent, at no additional cost to the city. The Scranton proposal utilized a comprehensive approach to costing out EMS service. The IAFF factored in the following costs for EMS start-up: Fire training; ALS/BLS supplies for fire engines; ALS/BLS supplies for ambulances; Defibrillators; Automated defibrillators; Radios; Portable radios; Cellular phones; Fire training for new hires; Salary and benefits for current employees; Salary and benefits for new employees. The Scranton model also included continuing costs for the EMS program.

Additional information was obtained from Ms. Lori Moore Director of the Department of Emergency Medical Services for the International Association of Fire Fighters. Ms. Moore was able to supply information pertaining to the start-up costs associated with minimum requirements based upon the Pennsylvania Department of Health standards for ambulance licensure. These start-up costs were based upon a two-vendor approach to supply allocation (Appendix E).

The I.A.F.F. text, Emergency Medical Services: A Guide Book for Fire-Based Systems outlines a specific method for determining personnel needs for fire-based EMS programs. The guide presented in that text allows individual fire departments to apply a

template to determine how much staffing is needed and the costs associated with the same. The equipment is needed and that associated cost. What revenue projections could be and finally a three-year balance sheet to show a long-range projection (I.A.F.F., 1999)

In 1994 the IAFC conducted a survey of 420 fire departments across the country to determine several issues concerning EMS in the Fire Service. In 185 of the departments surveyed, results revealed that \$82,241,000.00 in revenue was received from EMS. These 185 respondents only represent one half of one percent of the approximately 32,000 fire departments in the country. The IAFC went on to further estimate that if all fire departments performed and charged for EMS services at the same rate indicated by the 185 respondents total revenues would be in excess of fourteen billion dollars (IAFC, 1994).

In a 1995 the EMS Section of the IAFC established a list of goals for itself. First on the list was developing a cost allocation method that the fire service could use to determine the relative cost of providing EMS in a dual-role organization (Krakeel, 1998). The cost of providing EMS, according to Krakeel, should include: labor, including salaries and benefits; material, such as supplies and fuel: equipment maintenance and replacement; vehicle replacement and maintenance; insurance, including workman's compensation and liability; indirect expenses for administration, training, legal, station maintenance.

Inclusive in Krakeel's writings is a formula for calculating costs:

A: Personnel costs = Average on-call time x Average hourly labor rate x Number of personnel on call. (Hourly rate = Average hourly wage x Benefits as a percentage of hourly wage).

B: Vehicle = (Operating cost per mile x Annual miles) + Average annual replacement cost.

C: Supplies = Actual expenditures.

D: Indirect costs = 20% (A + B + C) Where the 20% is used to recognize organizational support costs.

Indicative of both the Scranton model and the formula described by Krakeel is a marginal cost approach to determining EMS costs. With a marginal approach expenditures that are only associated with EMS are calculated. As expressed by Krakeel, if a an agency decides to provide EMS with an existing labor force they shouldn't have to account for personnel related expenditures such as wages, benefits and uniforms.

Revenue Generation

The Scranton model includes a revenue projection template that was used as a partial basis for determining the possible income potential for the Johnstown Fire Department. Additionally, interviews were conducted with Val Cameron, Office Manager for West End Ambulance and Linda Pfeil, Billing Clerk for Seventh Ward Ambulance. These interviews were conducted to determine average charges for ambulance calls in the city of Johnstown. An interview was also conducted with Ms. Erin Morrison of Ambcoach Reimbursement Management Solutions Incorporated. Ms. Morrison was able to provide insight into the percentages of collectable receipts. Ms Cameron was also able to provide insight into collection percentages germane to the area. The Author also interviewed Mr. Gordon Sachs instructor in the Advanced Leadership Issues in Emergency Medical Services for the National Fire Academy. Mr. Sachs also provided information on collectable percentages.

Opposing Views

During the literature review this author found many references to the negative aspects associated with EMS transport in the fire service. Opinions have varied from increased response times resulting from fire station consolidation to increased expenditures resulting from overtime or additional hires.

Additional opposition has come from the rank and file employees who are being asked to perform the extra duties of EMS.

In examining the merger of the City of New York Fire Department with the City of New York Emergency Medical Services, Phillip Weiss noted several problems. Weiss found that there was a cultural difference between these two emergency services. The fire service was used to working as a team with up to 25 members on the usual team, meanwhile the EMS sector was used to acting almost independently. The loss of the EMS identity is also noted by Weiss as a considerable source of ill feelings (Weiss, 1998)

Ryan Gresham noted in 1994 that friction might arise when those interested exclusively in fire fighting are asked, in a newly EMS integrated fire department, to perform duties they didn't enter the fire service to undertake (Gresham, 1994).

Additional negative thoughts on EMS in the fire service were found in a three-part article by Mary Jane Dittmar, which ran in Fire Engineering magazine in July and October of 1993, and concluded in July of 1994. In addition to the exclusiveness sometimes associated with fire department personnel, Dittmar noted that: The workload vastly increases when EMS functions are brought into a department. EMS work increases personnel exposure to many communicable diseases and often brings personnel in contact with human blood, vomit, feces and body fluids. Inaccurate perceptions of

EMS personnel's functions and responsibilities have led to the misconceptions that affect the image of the EMS worker, who has not always enjoyed the same positive image as the firefighter. Many EMS workers do not want to be firefighters. Some EMS workers think of themselves as health-care professionals and do not care to fit into the quasimilitary fire structure. Ambulance runs generally take longer than an hour per call. In addition ambulance calls are much more numerous than fire calls in most fire departments.

Gresham also noted additional concerns about fire department involvement in EMS in the March 1994 issue of EMS Magazine. Several contributors to that article voiced concern over the reasons why fire departments undertook EMS. Simply getting into EMS for the revenues generated or the increase in manpower generated was questioned in the article. The level of commitment that the fire department was willing to give EMS was also questioned.

One of the big arguments to come from the EMS sector when the fire department has tried to annex them is that they are not treated as equals, only as a stepchild (Gresham, 1994).

PROCEDURES

Research Methodology

The organization of this paper reflects the process followed in the research. The desired outcome of this research was to determine if EMS transport were to be undertaken could additional staffing be put in place for the Johnstown Fire Department. The research was conducted utilizing an extensive literature review, the evaluative and historical approach. The initial literature review was conducted at the National Fire

Academy's Learning Resource Center. Additional research came from the author's own library and the Cambria County Library. Interviews were conducted with several individuals who had pertinent information regarding the problem presented. Additional information was obtained from the International Association of Fire Fighters in Washington, D.C. Emergency response data was garnered from the Cambria County Department of Emergency Services (Appendix, B).

The City of Johnstown Finance Office provided salary information (Appendix, D). This information was used in determining costs associated with the increased staffing levels that would be needed to incorporate EMS and increased manning levels for the fire apparatus.

Assumptions and Limitations

The research conducted into the feasibility of increased staffing via the use of EMS receipts was limited to current billing schedules and fees used by the two ambulance services protecting the City of Johnstown. The research was conducted with current personnel costs for the Johnstown Fire Department. Information on the return of outstanding receivables was not readily available in printed form. Instead the author relied on interviews with individuals familiar with EMS billing and a projection of revenue recovery done for the Scranton Fire Department. The author utilized additional information obtained from a literature review. Every attempt was made to guarantee the accuracy of that information.

Limitations that were presented included the fluctuation in the actual number of EMS responses per year in the city. Information was limited to 1997 statistical response data and does not take into account membership subscription revenues. Subscription revenues

were not calculated because it is difficult to predict the number of subscription on a year to year basis. Additional limitations were presented by the proprietary nature of some of the information, and the unwillingness of some agencies to divulge financial particulars. It was difficult to obtain salary information from the two ambulance services. The lack of salary information did not present a significant problem because all salaries would be based on current collective bargaining agreement requirements for the City of Johnstown.

Assumptions were made that the number of EMS responses would remain the same for at least the start up period of the operation. It is also assumed that the average receivable collection rate of 85% will remain the same. Additionally assumptions were made regarding applicable expenditures remaining the same or increasing only marginally.

It was also assumed that any labor issues regarding the implementation of EMS transport could be resolved.

Assumptions were also made that the initial employees hired would already be certified as paramedics thus eliminating the need to expend monies on training other than fire training. It was also assumed that the fire training for the new employees would be conducted in the same on-the-job manner now employed by the Johnstown Fire Department. Additional assumptions were made that the computerized EMS electronic data capture now being utilized by the Johnstown Fire Department EMS program would continue to be used. It was also assumed that all existing insurance's and any new insurance's would be absorbed by the city's insurance carrier without substantial increase in premiums. Calculations on revenue generation reflect regional averages for the City of Johnstown. Revenue projection was based on Medicare reimbursement scheduled

provided the Author by both ambulance services now providing coverage to the City of Johnstown. Assumption was made those insurance carriers other than Medicare would follow Medicare's lead in amounts reimbursed.

RESULTS

Answers to Research Questions

Research Question1. In an effort to establish start-up costs the first thing that needs to be addressed is the level of service necessary to maintain the levels of service now enjoyed by the community. Currently the two ambulance services provide treatment and transport from five locations utilizing ten ambulances. Staffing fluctuates for both services from shift to shift and not all ten ambulances are staffed at all times. During peak service hours there are a total of sixteen crewmembers on duty between both services, manning eight ambulances. During off-peak hours there are a total of ten crewmembers on duty, manning five ambulances. There are two crewmembers assigned to each ambulance. Based on statistical information provided by the Cambria County Department of Emergency Services there were 9,398 responses in the city during 1997. With this information in hand it easier to determine the number of ambulances and personnel to staff them. Based on a call volume 9398, the average daily number of calls was 26, or approximately 1.07 calls per hour. The disproportionate number of responses versus staffing during daylight hours stems from the non-emergency transport service rendered by both EMS providers. Based on the average hourly number of responses reflected a minimum staffing level of six persons would be sufficient to provide adequate coverage per shift. Current staffing trends provide for two people per ambulance,

therefore three ambulances would be staffed around the clock. A fourth ambulance would be kept in reserve for additional staffing and for use as a replacement during times of vehicle maintenance and repair.

Currently the Johnstown Fire Department works a ten and fourteen hour work shift. Members of the department work three ten hour days which is followed by three days off then three fourteen hour nights. Based on the call volume indicated an additional 24 per shift would be created. Utilizing the staffing worksheet provided by the International Association of Fire Fighters and plugging in the numbers for the Johnstown Fire Department a staffing ratio of 1.1 for every new position created is arrived at. This translates into an addition of 28 personnel. Increasing staffing by 28 people would increase personnel costs by \$935,004 or \$935,312. The former figure being arrived at utilizing the Krakeel model and the latter number utilizing the utilizing information provided to this author by the City of Johnstown Finance Department. This figure being arrived at by calculating base starting salaries and fringe benefits for current employees of the Johnstown Fire Department.

Additional personnel expenses would include uniforms at approximately \$1,000.00 per employee, protective structural fire fighting clothing \$1,200.00 per employee and various inoculations at approximately \$300.00 per employee.

Total employee start up costs would be \$1,005,314 utilizing the information from the Finance Department.

The Pennsylvania Department of Health (PaDOH) establishes standards for ambulance equipment requirements. Based on the minimum requirements set for by the PaDOH information was garnered from the International Association of Fire Fighters

EMS data base (appendix). This data base compares equipment costs from two vendors. Data provided revealed the costs associated with equipping ambulances for licensure in the State of Pennsylvania. Equipping a single ambulance to minimum PaDOH standards would cost \$27,175.69. Multiplying this figure by four there would be a total equipment cost of \$108,702.76.

There are several methods for obtaining the needed vehicles to employ EMS transport in the City of Johnstown. Vehicles could be purchased outright, leased or leased to own. The type of vehicle(s) purchased or leased would greatly influence the initial startup costs of the EMS transport system. The Wheeled Coach Corporation provided information on either conventional chassis ambulances or van style ambulances leases and direct purchases. Leases ranged from \$27,263.00 to \$27,873.00 annually or \$72,500.00 to \$71,500.00 for purchases. Interest rates for the lease options mentioned above were calculated at 10.3/8% APR. Total repayment for the Type I ambulance would be \$84,789.00 and \$83,619.00 for the Type III ambulance. A 5% deposit is required for all purchases. The initial cost for ambulances, based on the Type III style, would be \$14,300.00. This would be for four ambulances at the purchase option.

Based on interviews conducted with Mr. Terry Cramer, Manager of West End Ambulance Service in Johnstown, Pennsylvania the author identified costs associated with the purchase of van style, or type II ambulances utilized by his service. The price of the van style ambulance was approximately \$45,000.00. The total price for four ambulances of this type would be \$180,000.00.

Miscellaneous start-up costs would be marginal. Aside from personnel, vehicles and equipment the only material needed for start-up would be radio equipment. Based on

information provided by the I.A.F.F. radio equipment would cost approximately \$1,200 per unit, for a total of \$4,800.00 (appendix E).

Based on the four start-up components outlined (utilizing the type II style ambulance) above the total start-up costs associated with the proposed EMS program would be \$616,418.00.

Research Question 2. Revenue from the 6092 emergency medical responses detailed earlier has to be further broken down into advanced life support and basic life support billable receipts. Total ALS responses were 6937, inclusive of 1,653 non-emergency transport and BLS responses totaled for 2461 of which 1,653 were scheduled transports and 808 were emergency responses. ALS non-emergency transports account for 23% of all ALS responses. BLS non-emergency responses accounted for 67% of all BLS trips.

Based on information provided by Seventh Ward and West End Ambulances the average ALS invoice was \$460.00 and the average BLS invoice was \$250.00. The return to both services from Medicare was 57%. The average ALS invoice would yield \$263.00 and the average BLS invoice would yield \$143.00. Based on the assumption that of the 5,284 emergency ALS responses would result in transport and based on the assumption that all of the 1,653 non-emergency transports would produce revenue. The average collection return was 85%. Based on the average return provided the amount of revenue generated for all ALS responses would be \$1,403,368. Using the same formula for BLS responses the return would be \$315,780. Total of the two would be \$1,719,148

Research Question 3. Staffing levels could be increased in the Johnstown Fire Department via the use of EMS receipts. 28 persons would have to be hired to implement the new EMS program. As mentioned above initial salaries, uniforms,

equipment and inoculations would incur an additional \$70,000 in the start-up cost. The total start-up cost for equipment and personnel would be \$1,621,732. Total revenues would be \$1,719,148 a difference of \$97,416.

Research Question 4. Utilizing the Krakeel model of cost allocation, total annual costs for running the EMS program would be \$1,297,608. Based on the amount of revenue generated an additional \$421,540 would be generated after covering expenses. Based on the average salary figures presented earlier there would be sufficient funds available to hire an additional 12 persons. The money's generated from EMS transport could sustain the staffing needed for EMS delivery. Additional money's could support the addition of 12 fire fighters.

DISCUSSION

The use of EMS to increase staffing levels has long been a source of debate. As the fire load in the United States has continued to drop and the tax base in many cities has either fallen off or stabilized to the point where it cannot support the traditional personnel heavy fire service new areas of service and funding must be found. Interestingly the International Association of Fire Fighters who used to take a hand off approach to EMS matters has strongly come to support fire department involvement in emergency medical services, especially regarding transport. In many areas of the country battle lines have been drawn over EMS transport issues. Several major corporations have been formed from the EMS transport business. Fire Departments who now provide EMS transport services have been attacked by large for profit conglomerates trying to acquire their lucrative markets. Similarly fire departments have been trying to push their way into the

transport business that was traditionally held by private companies. In an unprecedented show of cooperation the International Association of Fire Chiefs and the International Association of Fire Fighters issued a joint resolution in January of 1991 calling for the support of fire based EMS systems (IAFC, 1995).

The literature review revealed the immediate need for additional staffing for the Johnstown Fire Department. Nationally accepted standards, publications and periodicals indicated the need to increase staffing in order to lower injuries and have more efficient operations. Additional writings have stated that increased fire ground staffing increased fire department efficiency. The literature review also suggested that EMS belongs in the fire service due to existing training, manpower, access and structure.

Unfortunately the author was confronted with conflicting information on costing out EMS services. The two written sources of information varied in their methodology and outcome. Information was difficult at best to elicit from the two ambulance services currently providing EMS coverage in Johnstown.

The cost allocation model utilized by the author does not amortize capital expenditures. The author wanted to show total possible costs associated with EMS service delivery. If the capital expenditures were amortized over the course of three years the startup costs would be greatly lowered. Additionally, if ambulances were leased instead of directly purchased the initial startup cost would also be lowered.

Another alternative to defer the high startup cost associated with the EMS program would be to merge with the two existing ambulance services in the city. A merger would significantly lower startup costs by providing most of the capital and disposable equipment for free or at a greatly reduced cost. Another potential advantage of merging

three services into one would be the potential income generated from selling or leasing the two EMS services current buildings. Both of these building are relatively new, Seventh Ward's is less than two years old and West End's building is less than nine years old. There would be no need to maintain these structures because the City already has three stations strategically located to offer optimal response time.

As evidenced in research question four there would be additional revenue available to hire 12 additional personnel. This would allow hiring an additional three personnel per shift.

The addition of three personnel per shift increases staffing 25%. This addition would increase staffing by one person on each engine. In the writings of Varone an addition of one person to a three-person engine company reduced injuries by 24%. Varone also noted that four person engine companies had a decrease in time loss injuries by 25%. A more astounding fact to emerge from the Providence study was the amount of time lost from on the job injuries in four person engine companies. A decrease of 71% in the time lost due to injury was recorded when engine companies in the Providence study were staffed with four persons.

Almost all of the research indicated that the Johnstown Fire Department should pursue an aggressive approach to EMS delivery.

RECOMMENDATIONS

This author firmly believes that the Johnstown Fire Department has enough justification to pursue an all-encompassing program of EMS delivery. The key to the successful continuation of fire protection, as it is now provided to the residents of Johnstown, lies in the ability of the Johnstown Fire Department to find alternative methods of funding. Methods of funding that don't rely on the traditional tax base structure that can no longer support the core service groups as they once did.

The City of Johnstown should begin investigating EMS delivery as soon as possible. The International Association of Fire Fighters should be contacted through the local bargaining unit to perform an EMS delivery proposal. A committee comprised of line, staff and administrative personnel should be convened to examine all the issues from personnel and legal standpoints. This committee should utilize the National Fire Academy's Strategic Management of Change Model to facilitate the smooth integration of EMS into the Johnstown Fire Department.

After the completion of the I.A.F.F. study the city should begin to examine various methods to finance the start-up of the EMS program. Capital expenditures should be moneys generated from the capital improvement fund generated by the special commuter tax, which was established when the city filed for distressed status. The city should also issue a special bond to fund the EMS program. Commercial lenders should also be contacted to supplement any public moneys used for the start-up. An aggressive approach should also be made to obtain grants for the program.

The current ambulance providers should be brought into the system on a voluntary basis, however if they refuse to merge with the city then the city must be resolved to take them over in a hostile manner.

Intermediate planning should include cross training as many people as possible to the paramedic level. After this training has been completed all engines in the city should be equipped with advanced life support equipment. Equipping engine companies with this type equipment and implementing a dual response program would allow engine company crews to apply early advanced life support to patients when traditional ambulances are engaged on other responses. Additionally ALS engines may cancel ambulances when they are not needed thus freeing up the ambulance resource.

Long range planning should be implemented immediately. Inclusive in these long-range plans should look to an expanded scope of service. Additional long-range plans should include contracting EMS services to surrounding communities.

Implementation of the program should commence after a brief, but intensive public relations campaign. The purpose of this campaign is two fold, first to inform the public of the transition from the old ambulance providers to the fire department based service and secondly to insure a smooth transition and “buy in” to the new service from the public, elected officials and staff. The latter needing reassured of the publics’ trust and commitment to them. Public relations is the process of getting people to know you, like you and support you. It attempts to create and use positive opportunities for public contact and avoid situations which will lead to criticism of the fire department

(V. McNally, 1982).

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Appendices Not Included. Please visit the Learning Resource Center on the Web at <http://www.lrc.fema.gov/> to learn how to obtain this report in its entirety through Interlibrary Loan.