Expanding from BLS to ALS for the Harrison Fire Department

By: William R Hursong
Fire Chief
Harrison Fire Department
200 Harrison Avenue
Harrison, Ohio 45030

A research project submitted to the Ohio Fire Executive Program

15 August 2007

CERTIFICATION STATEMENT

I hereby certify that the following statements are true:

1. This paper constitutes my own product, that where the language of others is set forth, quotation marks so indicate, and that appropriate credit is given where I have used the language, ideas, expressions, or writings of another.

2. I have affirmed the use of proper spelling and grammar in this document by using the spell and grammar check functions of a word processing software program and correcting the errors as suggested by the program.

Signed: _____

Printed Name: William R. Hursong

ABSTRACT

The problem this study investigated was, "Is it feasible for the Harrison Fire Department to implement its own paramedic program". The purpose was to determine the cost associated with implementing a paramedic program for the Harrison Fire Department. The project was conducted using descriptive and evaluative research to identify the following research questions: 1) Does historical data support the need to provide a paramedic service, 2) What would be the associated cost for implementing a paramedic program, 3) What would be the alternative revenue resources to fund this program, 4) Can the current HFD organizational structure support this change in service delivery.

The procedures used included a literature review, review of the Harrison Fire Department policies and procedures, HFD 2004-2009 Five Year Improvement Plan, salary scales, certification levels, fire and EMS incident statistical data, and city ordinances related to the division of fire and EMS.

A survey of the HFD personnel was conducted in October 2006 to ascertain their feelings about EMS delivery expansion. An additional survey was conducted with local fire department officials recently involved in the expansion of their EMS services from BLS to ALS. A cost analysis was conducted to determine associated funding needed for service delivery expansion.

Recommendations included redirecting current funding allocated for ALS delivery, increase billable amounts generated through Medicount Management, implement a recruitment program specifically directed towards part-time paramedics; develop a program and timeline to have all fulltime personnel certified at the paramedic level.

TABLE OF CONTENTS

INTRODUCTION

Statement of the Problem

Over the past ten years, the requests for emergency services have grown in Harrison, Ohio. The Harrison Fire Department (HFD) has experienced a 30% increase in request for emergency medical services in then last five years. The Harrison Fire Department operates out of two stations staffed with eight people on duty, each twenty-four hour shift. The Harrison Fire Department is a combination department comprised of full-time and part-time personnel that are trained at the EMT Basic, Intermediate and Paramedic levels.

The City of Harrison entered into an agreement in 1996, along with four other political subdivisions, with the Western Joint Ambulance District (West JAD), to provide advanced life support (ALS) to its citizens. ALS is defined as emergency medical treatment beyond basic life support level as defined by the medical authority having jurisdiction (NFPA, 2004, 3.3.37.2). WestJad is a non-transport service agency that provides paramedic level care with the local fire departments within its response district. West JAD operates out of two centrally located areas in southwestern Hamilton County, Ohio to cover a total of 72 square miles. WestJad responds in an order of call received basis, which eliminates their ability to cover the entire response district.

As anticipated, run volumes for the entire WestJad response area have increased causing a delay in ALS to the citizens of Harrison, and the contracted area's that are provided emergency medical services by the Harrison Fire Department.

The problem this study will investigate is it feasible for the Harrison Fire Department to implement its own paramedic service. By not having their own paramedic service, the Harrison Fire Department is prevented from achieving its mission by not providing optimal levels of

emergency medical care to its citizens. Until this problem is reviewed, the quality and effectiveness of the Harrison Fire Department emergency medical services is not fully realized.

Purpose of the Study

The purpose of this research project is to determine the cost of implementing a Paramedic program for the Harrison Fire Department. Harrison currently relies on a contracted paramedic service to provide Advanced Life Support to its citizens, which at times causes a delay in advanced life support to their community. The citizens of Harrison are currently paying for this service through a 1.25 mil tax levy, which generates approximately $169,776.00 annually (D. Rhodes, Hamilton County Auditor, 2006). The Harrison Fire Department wants to continue to meet the expectations of their citizens and provide the level of service demanded by the growing community. This research should also show the need to identify alternative funds for the HFD to provide a paramedic service, and provide the organizations' administration with an alternative service delivery model for consideration with an improved paramedic delivery system at an affordable cost.

Research Questions

This study will use the following research methodologies: (a) descriptive and (b) evaluative research to evaluate the cost effectiveness of a paramedic program.

The research questions this study will investigate are:

1. Does historical data support the need to provide a paramedic service?
2. What would be the associated cost for implementing a paramedic program?
3. What would be the alternative revenue resources to fund this program?
4. Can the current HFD organizational structure support this change in service delivery?

BACKGROUND AND SIGNIFICANCE

The City of Harrison Fire Department is located in southwestern Hamilton County, Ohio. The department provides 100% of the fire protection and emergency medical services to 4 square miles within the city limits and an additional 14 square miles for Harrison Township, Ohio. In addition, the Harrison Fire Department is contracted to provide fire and emergency medical services to West Harrison, Indiana, Harrison Township, Indiana, and Emergency Medical Services to Kelso Township and Logan Township, Indiana. These additional coverage areas consist of approximately 25 square miles.

The Harrison Fire Department, Harrison Township, Crosby Township Fire Department, Whitewater Township Fire Department, Village of Cleves Fire Department, and the Miami Township Fire Department were provided with paramedic service from the Franciscan Health System of Cincinnati Inc. since 1986.

In 1996 each of the mentioned communities were informed by the Franciscan Health System that they would no longer provide paramedic service. Faced with this situation, the fire chiefs of each community entered into discussions to formulate a plan to provide paramedic services to their communities. None of the five communities were in a position to provide paramedic services to their communities on their own, so a proposal was submitted to form a joint paramedic district. The concept was presented to the communities and each appointed a representative to work on this project collectively.

Over the next several months the group of representatives, together with the fire chiefs, worked to form the Western Joint Ambulance District (WestJad). Each community with the exception of the Miami Township Fire Department agreed by a vote of their council / trustees to

join the district and the Western Joint Ambulance District, a political subdivision unto itself, was born.

With a tremendous amount of input and guidance from the fire chiefs a plan for operation was formulated and a 1.25 mil levy was placed on the ballot and passed by a majority vote of the five districts involved. The plan, which was based on the service level previously provided by the Franciscan Health System of Cincinnati, called for two paramedics operating from a central location twenty four hours a day seven days a week. Each unit would be staffed with one paramedic in a non-transport vehicle and would provide ALS in one of the ambulance districts BLS transport units. WestJad would staff the district with one fulltime employee to run the day-to-day operations, and a staff of part time employees to fill the required shifts. Due to an increase in run volumes for the WestJad response district, the WestJad administration has felt the need to increase the staffing levels to four paramedics per day. The administration has indicated that they would like to staff one paramedic at each of the fire stations within their response district. This would allow staffing to be increased to four paramedics on duty everyday. Unfortunately, funding has not increased to meet service demands therefore compromising ALS service to the entire response district served by WestJad.

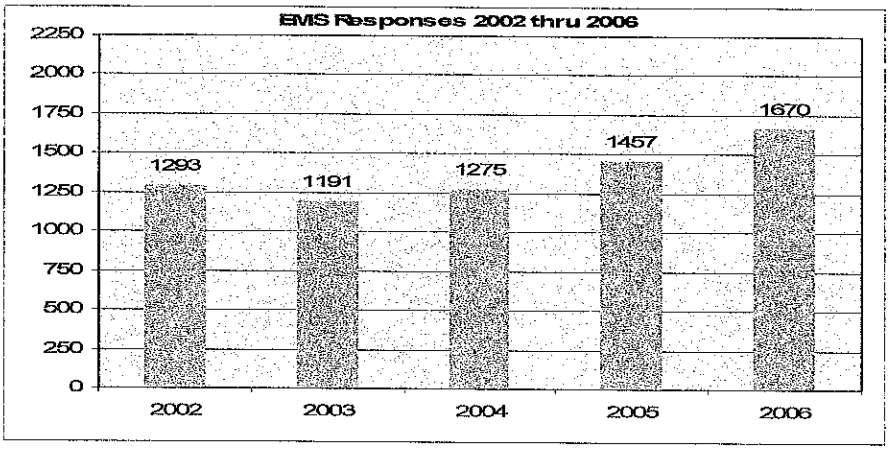
The City of Harrison has seen an overwhelming amount of development in the past five years that has caused an increase in service demands. This development includes approximately 900 new residential occupancies along with a 140 bed nursing home facility, multiple commercial businesses including the most recent zoning change to allow a Wal-Mart Super Center to be developed (City of Harrison, Planning Commission, July 2006). The City of Harrison has also recently been approached to approve annexation of 400 acres of farmland from Crosby Township, Ohio. The developer has plans to build 2 ½ homes per acre of land in this

area, which will be provided fire and EMS services from the HFD (Mayor D. Gieringer, City of Harrison, July 2006).

The HFD currently operates out of two stations with multiple automatic and mutual aid agreements from its neighboring departments. The HFD operates with 16 full-time employees and 14 part-time employees. Four personnel at Station 56 and four at Station 57 man the stations. All full time personnel must be certified at the Ohio Fire Fighter II level and Emergency Medical Technician Intermediate (EMT-I) level. Part-time personnel must be certified at the Ohio Fire Fighter I level and Emergency Medical Technician Basic (EMT-B) level. The HFD currently has six fulltime employees trained at the Emergency Medical Technician Paramedic level (EMT-P). HFD operates four BLS transport units staffed by EMT-B, EMT-I, and EMT-P personnel that operate at the State of Ohio EMT-I 1999 protocol level. HFD provides limited ALS services with the exception of advanced cardiac care; HFD relies on WestJad for paramedic level care to its citizens.

Run volumes over the past five years have increased causing a delay in ALS to the citizens of Harrison. The contracted area's that are provided emergency medical services by the HFD in Indiana currently do not have an agreement with WestJad to provide paramedic services to their citizens. When the need arises the HFD must request a response from WestJad to respond to a location in Ohio for paramedic intervention.

Table 1 HFD EMS Responses 2002 -- 2006



EMS Response times within the HFD response district average 4 minutes and 24 seconds (HFD annual report), with the average WestJad response time in the range of 6 to 8 minutes (Lieutenant D. Nusekabel, HFD, personal communication, July 2006). The average HFD EMS turn around time from dispatch until unit back in service is 1 hour and 41 minutes, this alone causes delayed ALS to citizens in the entire response district that WestJad covers (HFD annual report).

Table 2

Average Length of HFD EMS detail

Transport Units	Average Length of Call
Squad 56	01:41:39
Squad 57	01:47:58
Squad 256	01:34:58
Total Average Length of Call	01:41:18

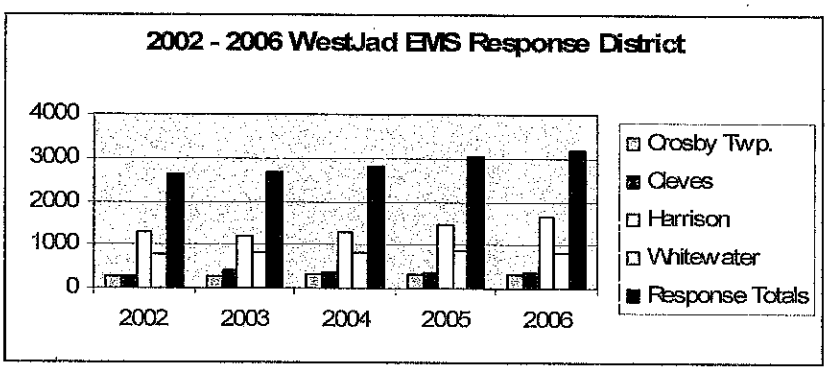
According to the HFD five year improvement plans, "The need for establishing a firefighter / paramedic service within the HFD that would eliminate our dependency on the

WestJad Paramedics is becoming more obvious with each passing day". (Harrison Fire Department, Five-Year Improvement Plan, 2004, p. 5).

In review of the HFD ALS Tiered Response Analysis Report ranging from January 1, 2005 through July 31, 2006 the HFD responded to 1484 ALS protocol responses, of which WestJad arrived on scene 1270 times and transported 558 with the HFD. There were 711 no paramedic transport responses and 214 no paramedic available responses (HFD annual report, 2005). WestJad responds to ALS details in a non-transport vehicle based on a first call basis. When the HFD utilizes WestJad for a medical emergency the remaining communities are left uncovered for ALS intervention on an average of one hour and forty one minutes until WestJad is back in service. (Table 2)

Table 3 shows a 20% increase in run volume of the WestJad response district over a five year period.

Table 3



In terms of potential impact this study will attempt to identify the factors and associated cost of implementing an alternative solution for paramedic delivery services for the Harrison Fire Department.

LITERATURE REVIEW

The purpose of this literature review is to gather information and answer the research questions to assist the department in the direction of providing the best ALS delivery model.

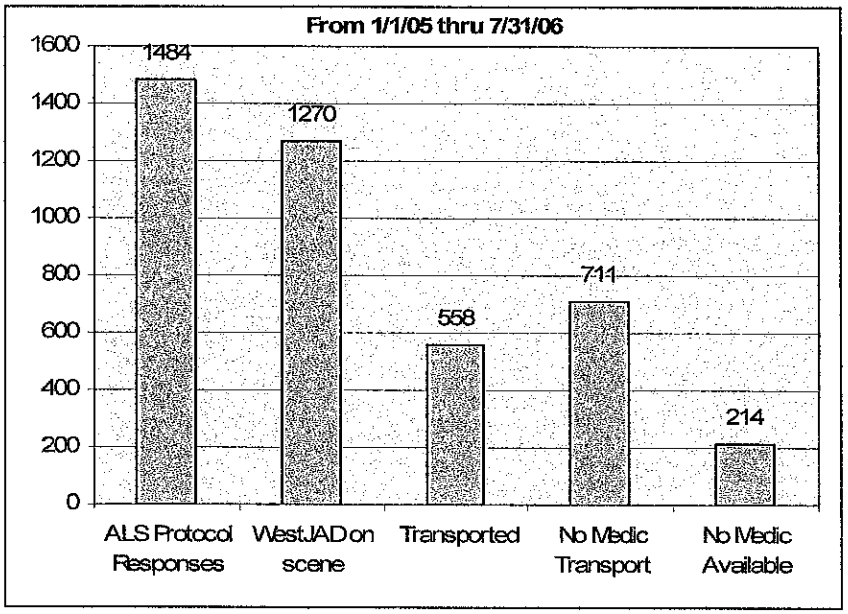
Information to evaluate historical data included a review of the HFD past response statistics and the Harrison Fire Department *2004 – 2009 Five-Year Improvement Plan.*

According to the plan, the need for establishing a firefighter / paramedic service within the HFD that would eliminate our dependency on the WestJad Paramedics is becoming more obvious with each passing day. (Kinnett, A. (2004) *Harrison Fire Department 2004-2009 five-year improvement plan).* City of Harrison, OH.

The Mission of this Fire Department is to provide a high level of customer service for our community, through fire prevention, education, fire suppression, and providing optimal levels of emergency medical services with the resources available. (Harrison Fire Department, Standard Operating Procedures, Mission Statement, 2006)

In review of the HFD ALS Tiered Response Analysis Report (Table 4) ranging from January 1, 2005 through July 31, 2006 the HFD responded to 1484 ALS protocol responses. WestJad was on scene 1270 times and transported 558 with the HFD. There were 711 no paramedic transport details and 214 no paramedic available responses (HFD annual report, 2005). This information was gathered from the HFD annual report for Ohio responses only and does not include the coverage areas of Indiana for the Harrison Fire Department. Tiered Response is defined as two agencies responding together in separate units to provide a service.

Table 4 HFD/WestJad Tiered Response



The National Fire Protection Association (NFPA) 1710 standard states that personnel dispatched to an ALS emergency should include a minimum of two people trained at the EMT-P level and two people trained at the EMT level all arriving within eight minutes or less, 90% of the time. The two paramedics need not arrive on the same unit or respond from the same department. (National Fire Protection Association, 2004)

Expanding from BLS to ALS first-response service is a positive step toward providing a higher level of service to the citizens and visitors of the jurisdiction (Sachs, 1997).

According to P. Michael Freeman, "At the beginning of the twenty-first century, EMS accounts for 70 to 80 percent of annual emergency responses made by fire departments" (Compton and Granito, 2002, p. 129).

Upgrading from BLS to ALS is not cheap. Local and state requirements typically mandate that specific equipment, supplies, and medications be carried on all ALS response units.

Depending on these requirements, the cost can range from $10,000 to $20,000 per unit. (Sachs, 1997)

A survey (Appendix I) of the HFD personnel was conducted in October 2006 to ascertain their feelings. The results indicated the majority respondents were in favor of the concept. The Woodlawn Fire Department expanded their EMS services in 2005 from BLS to ALS; one of the deciding factors for them was to have the ability to provide a paramedic service to their community. Paramedic Ryan Androne stated, "We utilized a tiered system with another department that would provide ALS to our community when needed. They would bill us for this service and it became nearly impossible to budget for ALS from year-to-year, it was time for Woodlawn to become independent and begin providing paramedic services. We felt that we had individuals on this department who had the experience and desire to make this happen. It is incredibly nice to be able to offer this service to our community". (Androne, R. Woodlawn Fire Department, 2006)

In 2001 The Ross Township Volunteer Fire Department expanded their EMS services from BLS to ALS. In a personal interview with EMS Captain Charlie Caudill he stated, "This was the best thing we ever did for our community". He went on to say that the reasoning for expanding to ALS was to have the ability to provide the highest level of Emergency Medical Services to our citizens. Ross Township operates a tiered system with 4 ALS transport units and 1 ALS chase vehicle, they also operate under the State of Ohio protocol that allows them to transport with one paramedic. (Captain Charlie Caudill, Ross Township Fire Department, 2006)

In 1997, The Miami Township Fire Department, Hamilton County, Ohio established their own paramedic program, when asked what deciding factors helped with this change in EMS delivery, Fire Chief Jim Hughes, stated that "cost was a factor, when we reviewed the cost to our

citizens to join a joint paramedic program it would have increased taxes by 1.25 mils, we decided to go with our program and place a levy on the ballot and utilize our employees to offer a paramedic program with cross-trained firefighters. With passage of the levy our start-up cost was in the range of approximately $50,000 for a chase vehicle and additional supplies". (Chief Jim Hughes, Miami Township Fire Department, 2006) Chief Hughes went on to say, "We control the entire system and can make the necessary changes when needed. We operate a tiered system that includes a paramedic chase unit staffed with one, and a paramedic on the transport unit to complete the system, when we are short we can pull an on duty paramedic from the life squad and have two paramedics operate from our chase vehicle. We also offer paid training for our personnel wishing to obtain paramedic certification".

A salary review was conducted to determine the average wage for both full-time and part-time personnel operating at the paramedic level. The information for full-time personnel has not yet been received, however the average part-time rate for paramedics within the county for which the HFD operates ranges from $13.00 an hour to $15.20 an hour. The current top scale pay for part-time personnel at the HFD is $12.00 an hour for a Firefighter / EMT-I. (Harrison Fire Department, Standard Operating Procedures, Article 3, Section 8)

In review of the current cost to attend paramedic training to obtain certification, the cost is $4,587.18 per student. (Butler Technology and Career Development, 2006) The course requires the student to attend approximately 800 hours of classroom and clinical instruction combined.

In a personal interview with Lieutenant Doug Nusekabel of the HFD he stated "Start up cost for a paramedic program would be minimal, EMS supplies, equipment, maintenance of vehicles, and medications are already a budgeted line item, the only additional equipment needed

to meet state requirements would be upgrading our current automatic external defibrillators (AED) to more advanced 12 lead cardiac monitors and personnel".

The Ross Township Fire Department converted existing monitors to full 12 lead capabilities. Additional cost included the purchase of one additional cardiac monitor, drug bags and supplies; the total approximate start up cost of our ALS program was $35,000.00. (Captain Charlie Caudill, Ross Township Fire Department, 2006)

Funding for expansion startup cost for ALS first response can be generated in several ways, state funding; federal grants available from the Department of Transportation's National Highway Traffic Safety Administration, the Department of Health and Human Services EMS for Children program, the Federal Emergency Management Agency, or other federal agencies. (Sachs, 1997)

Beyond taxes, there are other ways to provide money for ALS. One is to find grants for things like equipment, training, and system upgrade. (Loiselle, 2005)

The HFD has received approximately twenty-five hundred dollars a year for the past four years in state ems grant programs for the purpose of training and education materials. They have also received a grant from the Duke Energy Corporation in 2006 in the amount of twenty-five hundred dollars towards the purchase of new cardiac monitors. (City of Harrison, Financial Report, 2006).

Because the local governments are often reluctant to raise taxes to support a service expansion, some other revenue sources should be looked at for ongoing cost. Instituting a fee structure (on a cost-recovery basis) could provide the revenue necessary to offset the additional cost of providing ALS. (Sachs, 1997)

EMS is a major role of the fire service, and is increasing in sophistication and scope. The cost of EMS, and who pays for them, are (or should be) tied to the national public health care cost debate. As has finally been accepted for many other types of emergencies, the fire service and independent EMS agencies are usually the first responders to acute medical problems and play a significant role in influencing how many people are introduced into the health care system, and in what condition. (United States Fire Administration, 2006)

There are two options for billing available to fire-based EMS systems. The first option is to use in-house billing services with the department actually billing payers or patients directly. Historically, fire department billing systems have had poor returns. (IAFF, 1997)

The second option for billing is to contract with a specialized billing company. The contracted billing agent takes on the responsibility for the entire billing system, including the follow-up. (IAFF, 1997)

Billing will not normally offset all costs of operations, but the revenue gained through billing provides a nice adjunct to tax revenue, grants, and other sources of income. (Loiselle, 2005)

The City of Harrison passed an ordinance in 1999 establishing charges for the use of emergency medical services, the ordinance reads as follows, A reasonable charge for the use of City's emergency medical services is hereby established, said charge shall be in an amount not less than the authorized Medicare reimbursement rate established for the City of Harrison, Ohio, under Title XVIII of the "Social Security Act," 49 Stat. 620 (1935), 42 U.S.C.A. 301, as amended. (City of Harrison, Public Record, Ordinance No. 28-99)

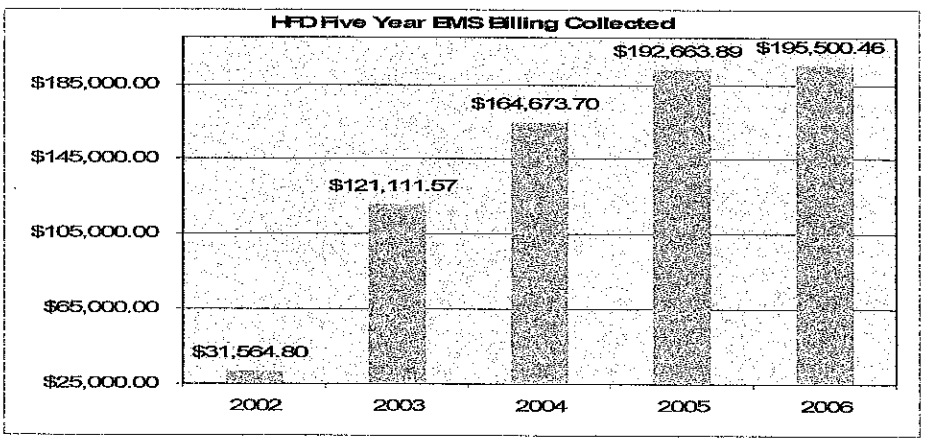
The HFD currently utilizes Medicount Management for EMS billing purposes. The current rate schedule is as follows, BLS transports $200.00, ALS transports $475.00, a recent

proposal was provided to the Harrison City Council members to increase billable amounts for EMS services. The new rate schedule proposal suggests increasing BLS to $350.00 with a loaded mileage rate of $7.00 per mile, ALS to $550.00 with a loaded mileage rate of $9.00 per mile. (Medicount Management, 2006)

The proposed rate increase would have a positive impact on the City of Harrison (T. Newcomb, Medicount Management, personal interview, 2006). The projected revenue should increase the amount currently collected by an estimated $160,000 per year (T. Newcomb, Medicount Management, 2006).

Table four shows a five year trend of EMS billing collected through Medicount Management (City of Harrison, Public Record).

Table 5 HFD EMS Billing 2002 through 2006



The best place to start when determining how to upgrade from BLS to ALS is right at home. A most important step you can take is to generate the support of the troops—the firefighters who will be providing the service. They have a powerful voice, since they meet the public every day where the service upgrade will make a difference (Sachs, 1997).

After your service has decided your reason for wanting to provide ALS is sound, the next question to ask should be, "Who?" Who is going to work for you and for how much? Can your

department afford all full-time paramedics? Or would a better solution be a more flexible combination of full-time, part-time, and paid on call paramedics? (Loiselle, 2005)

A survey (Appendix I) of the HFD personnel was conducted in October 2006 to ascertain their feelings. The results indicated the majority respondents were in favor of the concept.

The HFD currently employs 6 full-time paramedics and 4 part-time paramedics. Additionally, 6 personnel are currently attending a paramedic program to retain certification.

"Staffing was a major difficulty for us; we had to hire quite a few part-time paramedics to insure that we could provide paramedic coverage 24 hours a day, 7 days a week. Our department does offer paid training for full-time personnel. Part-time can also request training and it basically depends on funding available in the training budget". (Androne, R. 2006)

"One additional thing to consider would be your current Medical Director, in our case we had to find a new Medical Director that was Emergency Board Certified". (Captain Charlie Caudill, Ross Township Fire Department, Ross Township Fire Department, 2006) Captain Caudill further stated that they had to incorporate new protocols, which would allow them to provide ALS to their citizens.

In a letter to Harrison City Council from the HFD Medical Director Dr. Kevin Meyer he states, "I am in support of upgrading our city's emergency medical services from the current BLS level to ALS. I am fully behind this improvement and plan to continue as medical director to facilitate this". (Meyer, Kevin C., M.D., FACEP, 2006)

Important supporters include the elected officials and municipal managers (Sachs, 1997). Quite simply, it usually isn't a good idea for a fire chief to embark on a major project like this if his boss doesn't like the idea in the first place (Sachs, 1997).

In summary, the reviewed literature has influenced this research project by demonstrating an established need to explore an alternative paramedic delivery method. The information obtained from this literature will be used to support the recommendations contained within this research project to provide an alternative paramedic model that will provide effective and affordable services.

PROCEDURES

The purpose of this research project is to develop a document that evaluates the feasibility of expanding the Harrison Fire Department (HFD) Emergency Medical Services (EMS) from BLS to ALS. Descriptive and evaluative research methodologies were utilized to help direct the project to find answers to the research questions.

The development of the project began with instruction in research utilization and writing research papers through participation in the "Ohio Fire Executive Program" (OFEP) at the Ohio State University campus using the OFE *Course Manual*, and the *American Psychological Association* 5th edition text in 2006. Research and data collection began with a request by the author to the National Fire Academy's (NFA) Learning Resource Center (LRC) in Emmitsburg, Maryland in June 2006 through interlibrary loan. Articles from fire service trade magazines; fire service textbooks; Submitted Executive Fire Officer research projects, and related literature were reviewed for information relevant to this research project.

Personal interviews were conducted with Officials from local Fire Departments who were involved in the expansion of their EMS delivery models from BLS to ALS. Questions were asked as to understand the reasoning behind administrative decisions to implement this change in EMS delivery. Additionally, questions were geared towards the associated cost of such a program including staffing changes, response protocols and certification.

A questionnaire (appendix 1) was distributed by the Author via interdepartmental mail to the staff of the HFD. A total of forty-two questionnaires were distributed with a 100% return rate. The results were analyzed by the Author for pertinent information relating to this research project, and used to assist with the recommendations provided to the administration of the HFD.

An additional review of information was conducted on the internet using a Boolean search as an additional method of acquiring information related to this research project. A review of HFD documentation was also conducted, which included the *2004-2009 Five Year Improvement Plan*, salary scales, personnel certification levels, fire and EMS incident statistical data, and city ordinances related to the division of fire and EMS were also valuable tools used to gather information relevant in this research project.

Definition of Terms

Advanced Life Support (ALS) – Emergency medical treatment beyond basic life support level as defined by the medical authority having jurisdiction (NFPA, 2004, 3.3.37.2).

Automated External Defibrillator (AED) -- a device that administers an electric shock through the chest wall to the heart using built-in computers to assess the patient's heart rhythm and defibrillate as needed (NFPA, 2004, 3.3.16.1).

Automatic Aid -- The capabilities of personnel and equipment for a predetermined response to a neighboring jurisdiction upon receipt of an alarm, this process is accomplished through simultaneous dispatch, documented in writing, and included as part of a communication center's dispatch protocols (NFPA, 2004, A.3.3.1.1).

Basic Life Support (BLS) -- Emergency medical treatment at a level as defined by the medical authority having jurisdiction (NFPA, 2004, 3.3.37.3).

Boolean Search – a search that strings together several related terms (Ohio Fire Executive Program, Research Manual, 2006, p. 12).

Descriptive Research – determining and reporting the present status of something (Ohio Fire Executive Program, Research Manual, 2006, p. 19).

Electrocardiogram (EKG) – a record of the electrical activity of the heart. It shows certain waves called P, Q, R, S, and T waves, and sometimes a U wave (Taber's Cyclopedic Medical Dictionary, 18th ed, p. 610).

Emergency Medical Services (EMS) – a comprehensive network of personnel, equipment, and resources established for the purpose of delivering aid and emergency medical care to the community (Brady, Paramedic Care, Principals & Practices, 2000, p. 631).

Emergency Medical Technician-Basic – a person who holds a valid certificate to practice as an EMT-Basic. An EMT-basic may operate an ambulance and give emergency medical services to patients. Services may include determining the nature and extent of illness or injuries and establishing priority for required emergency services, opening and maintaining an airway, chest compressions, controlling hemorrhage, stabilizing fractures, assisting in childbirth, cardiac resuscitation, and any other services approved by adoption of a rule by the State Board of Emergency Services (Ohio Legislative Service Commission [OLSC], 2001, p. 42).

Emergency Medical Technician-Intermediate – a person who holds a current certificate to practice as an EMT-I. An EMT-I may perform the emergency services including the following: cardiac monitoring, electrical interventions to support or correct cardiac function, administering epinephrine, determining triage, and any other service approved by adoption of a rule by the State Board of Emergency Medical Services (OLSC, 2001. p. 42)

Emergency Medical Technician-Paramedic – a person who holds a current certificate to practice as an EMT-Paramedic. Paramedics may perform emergency medical services including cardiac monitoring, electrical interventions to support or correct cardiac function, airway procedures, relief of pneumothorax, administering appropriate drugs and intravenous fluids,

triage of victims, and any other services, including life support or intensive care techniques, approved by rule of the State Board of Emergency Medical Services (OLSC, 2001. p. 42).

Evaluative Research – the systematic process of collecting and analyzing data in order to facilitate decision-making (Ohio Fire Executive Program, Research Manual, 2006, p. 19).

Medical Director – a physician, who is legally responsible for all of the clinical and patient-care aspects of an EMS system (Brady, Paramedic Care, Principals & Practices, 2000, p. 635).

Mutual Aid -- A written policy or contract that allows for the deployment of personnel and equipment to respond to an alarm in another jurisdiction, this is part of the written deployment criteria for response to alarms as dispatched by a communication center (NFPA, 2004, A.3.3.1.2).

Political Subdivision – an entity (body corporate and politic) that is responsible for governmental activities in a geographical area smaller than that of the state; the four major ones are counties, townships, municipal corporations, and school districts; others include numerous special purpose districts such as conservancy districts, health districts and transportation districts (R.C. 2744.01(F)).

Tiered Response – a type of EMS system where BLS-level vehicles are initially dispatched to all calls unless ALS-level care is needed (Brady, Paramedic Care, Principals & Practices, 2000, p. 640).

Limitations of the Study

The results of this research project were limited by several factors and should be noted. The first factor was the lack of other local departments within southwest Ohio providing EMS delivery in the same configuration as the Harrison Fire Department. Most departments provide

an all ALS system or a combination of EMT's and paramedics staffing ambulances, with paramedic engine companies or paramedic chase units for transport. Another limitation of the study was a lack of information pertaining to the delay of ALS, or arrival on scene within the WestJad response district. The departments within the WestJad response district only provided documentation in regards to their EMS run volumes. Therefore, the only relevant information to this research was provided by the Harrison Fire Department annual reports.

An assumption is made that the remaining political subdivisions within the WestJad response district are satisfied with the current ALS delivery system and is not a question to be addressed at this time.

RESULTS

The results of the literature review provided the following answers to the research questions.

Research Question 1

Historical data from the HFD annual reports indicates that 71% of the requests for service are for EMS of which 64% meet the ALS protocol response guidelines. Historical data also indicated that of the 64% ALS protocol incidents 37% required ALS intervention and transport, of the required 37% of incidents 7% did not receive a response from the ALS provider due to being unavailable. With the statistics from the HFD annual reports, clearly ALS is necessary to the community. With 64% of all EMS calls meeting the ALS protocol, the fire department needs to increase its service level to the community.

Table 1 shows a five year trend from 2002 through 2006 of EMS responses for the HFD with a 77% increase in responses.

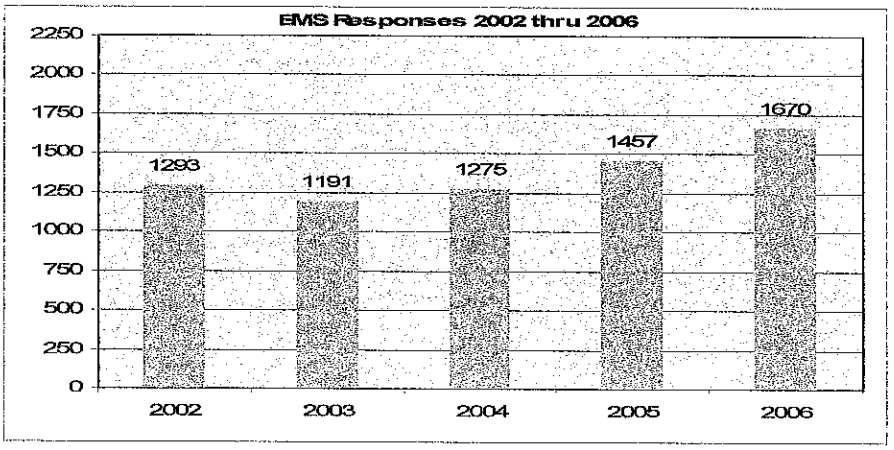
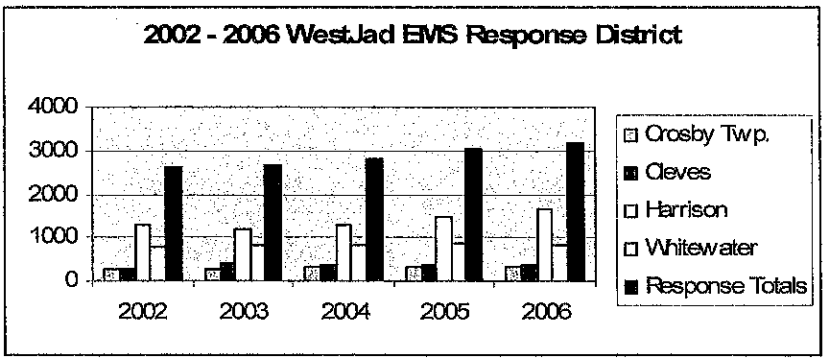


Table 3 shows a 20% increase in run volume of the WestJad response district over a five-year period.

Table 3



Research Question 2

Research indicates initial start up cost for an ALS program can be significant; however, a majority of the associated cost for EMS is already included in the HFD annual budget. The current budget allocates $25,000.00 for EMS supplies and equipment. An anticipated increase of $5,000.00 would be needed to cover cardiac medications, and miscellaneous equipment currently not carried by the HFD. Additional equipment needs include two (2) cardiac monitors at a cost of $36,000.00 combined; this would be for the first year only. Training cost for the HFD would be a significant factor when determining the feasibility of expanding to an ALS service. In order to require all full-time personnel to attend paramedic training the HFD would need to allocate funds to cover associated overtime cost, backfill cost, and full-time regular pay for on duty days while attending class.

See Appendix 4 for a detailed illustration. It is figured on a 24 hour on 48 hour off schedule where within a four week period it is anticipated a full-time employee would work 1/3 of the required training schedule. Additionally, the current collective bargaining agreement

allows for part-time employees to backfill for full-time employees while attending training or any other reason for time off.

Research Question 3

Alternative funding can be generated from several different sources; first the current funding provided to WestJad can be redirected into the HFD operating budget by a majority of city council vote to withdraw from the WestJad district. This sum of money would generate approximately $169,776.00 annually. Second, would be to increase the current billable amounts as proposed by Medicount Management. The amount of EMS Billing would increase by $148,548.86. This amount is based on the 2006 collected percentage rate of billable incidents which averaged at 37%. See Appendix 3 for a detailed illustration.

Research Question 4

The HFD organizational structure currently employees 6 full-time paramedics and 4 part-time paramedics, six additional part-time employee's are currently attending paramedic training.

In review of the HFD annual report current staffing levels could remained unchanged provided a minimum of 4 paramedics would be scheduled each shift. The number of paramedics and EMT's needed to staff a proposed BLS-ALS alternative service delivery model are described in the following: 4 Firefighter Paramedics and 4 Firefighter EMT's. These staffing requirements are the minimum amount of paramedics and EMT's for each 24-hour shift. Requiring all full-time personnel to obtain paramedic certification would provide for optimal staffing of a BLS-ALS delivery model. See Appendix 5 for a detailed Illustration.

The research has provided sufficient data to suggest staffing an ALS system would be difficult based on the number of paramedics required to staff each unit day. The data suggest through planning and recruiting the HFD organization can increase the number of paramedics to

support a BLS-ALS system in the interim until such a time that all full-time personnel become certified at the State of Ohio EMT-P Level.

DISCUSSION

Typically, departments in the southwest Ohio region that provide EMS do so in one of the following ways: 1) ambulances staffed by two paramedics; 2) fire apparatus designated as paramedic engine companies, with two paramedics plus two additional firefighter/EMT's; 3) a chase vehicle staffed with two paramedics; 4) any combination of the above.

The Harrison Fire Department currently relies on a contract paramedic service to provide ALS to its citizens through a tiered response program. Specifically, the HFD devotes a majority of its responses towards EMS, yet the level of service is not what the fire department would like to deliver. Nor is the current level of service in the best interest of the community.

The fact that the HFD has provided a tiered EMS response system to the community indicates the fire department did not forecast the future needs of the organization or the community. Furthermore, this research brings to the forefront a persuasive argument for redirection of the HFD resources and personnel into upgrading to ALS EMT-P services to the community.

It is apparent from the literature review that providing ALS to the community is the next logical step in EMS delivery to the community by the fire services (Sachs, 1997). Essentially the customer receives two services for the price of one when a fire-based EMS-delivery is used (IAFF, 1999). Another common thread is the ability for the fire-based system to provide faster response, thereby being able to provide a more timely ALS intervention (IAFF, 1999).

The results of this research project clearly identified that there has not been an official documented assessment of the Harrison Fire Department EMS system, and the organization's need to develop an effective measuring process for forecasting future EMS service delivery to its citizens.

During the time frame for the research project by the Ohio Fire Chiefs Association, the Western Joint Ambulance District has been successful in passing an additional 1-mil levy. The results of the voting have not yet been confirmed to determine the voting of the Harrison community. In addition, the new revenue amounts have not been published to determine the amount contributed by the residents of Harrison. The WestJad Board has published their new annual budget which is 1.2 million dollars, the Harrison residents contribution makes up approximately sixty percent of this funding. Although the WestJad administration sold the levy on staffing issues, the Harrison community is still experiencing difficulties in ALS responses received from WestJad. Further research needs to be conducted to include a survey of the citizens of Harrison to ascertain their feelings towards a fire department ALS program.

Through proper planning utilizing statistical data the HFD needs to educate the public on the benefit of a fire department ALS program. However, this could be a difficult task as most taxpayers are reluctant to support additional tax levies. The new levy could create difficulties for the HFD to implement or gain support for an ALS program. The HFD needs to seek several residents throughout the community to assist with this program. The results also indicate the City of Harrison could use a tax reduction approach to sell the program.

The City of Harrison planning commission along with City Council has approved three new residential developments that will result in approximately 900 new residential structures over the next five to seven years. In addition, a Super Kroger store has been approved for development along with a new multi-story hotel and numerous commercial developments. The HFD administration needs to develop a forecasting technique for future man-power additions along with implementing an ALS system to meet the current and future needs of city development and growth.

The HFD also received approval to update their current AED's to a more sophisticated cardiac monitor. This will drastically reduce start up cost of an ALS program by the sum of an estimated $72,000.00 dollars.

The original intent of the Western Joint Ambulance District has served the citizens and the staff of the HFD as it was intended. However, as the City of Harrison continues to grow, so will its request for service. The HFD administration should follow the recommendations of this research, so the continued delay, or lack of an ALS response will not have an impact on the citizens of the community. The new levy money allocated for WestJad will only delay the inevitable of future demands for service placed on all of the communities involved.

RECOMMENDATIONS

Based on supporting data and information through this research, recommendations would be made to change the manner in which the Harrison Fire Department delivers ALS to its citizens. Research indicated that the citizens of Harrison would benefit from a change that would provide a higher percentage response of an ALS unit when required.

To improve the effectiveness of the emergency medical service delivery by the Harrison Fire Department to its customers, the following recommendations should be considered:

1. Develop a program and timeline to have all fulltime personnel trained to the paramedic level. The HFD currently employs fifteen career personnel of which six are trained at the paramedic level. Mandating all full-time staff to acquire paramedic certification would allow for the staffing of five paramedics each twenty-four hour shift. The administration should implement this training requirement immediately as this would assist the department in moving towards exceeding its mission statement by providing optimal levels of EMS to the community.
2. Implement a recruitment program specifically directed towards part-time paramedics to identify shortcomings in staffing. Once this has been accomplished and a process is in place the organization can maintain the necessary number of paramedics to expand its current EMS delivery model. The current HFD schedule allows for two part-time staff each twenty-four hour period. Proper recruitment and retention of art-time paramedics would assure adequate staffing to fill these required shifts.
3. Redirect current funding allocated for the Western Joint Ambulance District into the Harrison Fire Department annual classified budget income. The current funding

provided to WestJad can be redirected into the HFD operating budget by a majority of city council vote to withdraw from the WestJad district. This sum of money would generate approximately $169,776.00 annually. This funding would help offset a majority of the cost to implement an ALS program for the HFD.

4. Increase current billable amounts through Medicount Management to maximum allowable by Medicare and Medicaid to include billable loaded mileage.

   The HFD currently utilizes Medicount Management for EMS billing purposes. The current rate schedule is as follows, BLS transports $200.00, ALS transports $475.00, a recent proposal was provided to the Harrison City Council members to increase billable amounts for EMS services. The new rate schedule proposal suggests increasing BLS to $350.00 with a loaded mileage rate of $7.00 per mile, ALS to $550.00 with a loaded mileage rate of $9.00 per mile. (Medicount Management, 2006) The proposed rate increase would have a positive impact on the City of Harrison (T. Newcomb, Medicount Management, personal interview, 2006). The projected revenue should increase the amount currently collected by an estimated $160,000 per year

Finally, the Harrison Fire Department needs to ensure that it maintains the quality and effectiveness of service delivery for its own community. In addition, the department needs to continuously work towards exceeding its mission statement by providing optimal levels of emergency medical services with the resources available.

REFERENCES

Androne, R., Woodlawn Fire Department, personal communication, October 2006

Butler Tech Public Safety Education, (September 2006 – February 2007) Course Catalog.

Caudill, C., Ross Township Fire Department, personal communication, October 2006

Cincinnati State Technical & Community College, (2006) fall course catalog.

City of Harrison, (1999), City Ordinance, Public Record, Ordinance 28-99.

City of Harrison (2006), City Budget, Fire Department Budget (Report)

Compton, D., & Granito, J. (Eds.). (2002). Managing *fire and rescue services.* Washington, DC: International City Management Association

County of Hamilton (2006, June). Western Joint Ambulance District Estimated Revenue (Public Record)

Crosby Township Fire Department (2002-2006). Annual Reports

Gieringer, D., City of Harrison, Mayor, personal communication, October 2006

Grubbs, G., City of Harrison, Tax Commissioner, personal communication, July 2006

Harrison Fire Department (2006, July). ALS Tiered Response Analysis (Report)

Harrison Fire Department (2006, January). Annual Report

Harrison Fire Department (2006, January). EMS Unit Response Time Analysis (Report)

Harrison Fire Department (2003). Standard Operating Procedures, City of Harrison, OH.

Hughes, J., Miami Township Fire Department, personal communication, October 2006

International Association of Fire Fighters (1999). Emergency Medical Services; A Guide Book for Fire-Based Systems. Washington D.C. International Association of Fire Fighters

Kinnett, A. (2004) *Harrison Fire Department 2004-2009 five-year improvement plan.* City of Harrison, OH.

Loiselle, Christopher (2005) Going Advanced: A How-to for small departments. Fire Engineering's fire EMS, 47-54.

Meyer, Kevin C., M.D., FACEP (2006) Medical Director, Harrison Fire Department

National Fire Protection Association, (2004) 1710 Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments, 5.3.3.4.3.

Newcomb, T., Medicount Management, personal interview, July 2006

Nusekabel, D., Harrison Fire Department, personal communication, June 2006

Sachs, G.M. (1997). Expanding ems: upgrading from BLS to ALS. *Fire Engineering*, 150, 110-112.

United States Fire Administration, (1999, December). Funding Alternatives for Fire and Emergency Services

Village of Cleves Fire Department (2002-2006). Annual Reports

Western Joint Ambulance District (2002-2006). Annual Reports

Whitewater Township Fire Department (2002-2006). Annual Reports

APPENDIX 1 – STAFF QUESTIONAIRE

1) Do you feel the HFD mission statement defines the current level of emergency medical services provided by the organization? Y or N (Please explain)

2) Do you believe that patient care could possibly be affected by the current EMS delivery model utilized by the HFD? Y or N (Please explain)

3) If you feel a change is needed, what type of emergency medical service delivery module do you feel would benefit your department and the citizens of your community? Such as Paramedic chase vehicle or Paramedic Engines. (Please explain)

4) Based on your answer to question #3, what advantages or disadvantages would this change in service bring to your community? (Please explain)

Your cooperation in this questionnaire is greatly appreciated and will assist with my research. Any additional info you feel is relevant please feel free to include it with your response.

Chief Hursong

APPENDIX 2 – FIRE DEPARTMENT PHONE SURVEY

1) What were some of the deciding factors associated with the expansion of your ems system from BLS to ALS? (Please explain)

2) What additional cost was encountered with expanding from BLS to ALS? (Please explain)

3) What additional staffing changes had to be implemented to adapt to the change in service delivery? (Please explain)

4) Does your department offer paid training and or continuing education to maintain certification? (Please explain)

Your cooperation in this questionnaire is greatly appreciated and will assist with my research project. If you have any additional information or comments that you feel are relevant please feel free to include it.

Respectfully,

Chief Hursong

APPENDIX 3 – HFD PROJECTED INCREASED FUNDING

			2006 Stats	*Current*
	BLS	***ALS***	***BLS***	***ALS***
Current Billable Rate	$200.00	$475.00	544	978
Total Billable Amount			$108,800.00	$464,550.00
2006 Actual Collected BLS & ALS Combined			0.37%	$214,236.14
			2006 Stats	Proposed
	BLS	ALS	BLS	ALS
Proposed Billable Rate	$350.00	$550.00	544	978
Total Billable Proposal			$190,400.00	$537,900.00
			2006 Stats	Proposed
	BLS	ALS	BLS	ALS
Loaded Mileage	$7.00	$9.00	544	978
Loaded Miles	20	20		
Total Billable Mileage			$76,160.00	$176,040.00
Total Estimated Billable BLS, ALS, & Mileage				$980,500.00
Total Estimated Collected Based on 2006 %			0.37%	$362,785.00
2006 Actual Collected BLS & ALS Combined			0.37%	$214,236.14
Increase in Revenue (Projected)				$148,548.86
Increase in Tax Revenue (Projected)				$169,776.00
Total Projected Increase in Funding				$318,324.86

APPENDIX 4 – STAFFING TRAINING COST

Paramedic Class	Employees	Total for Tuition
$4,587.17	9	$41,284.53

Fulltime Reg. Rate	Class Hours	Total Payable	Employees	Total Regular Pay
$17.71	800	$14,168.00	9	$127,512.00

Fulltime O.T. Rate	Class Hours	Total Payable	Employees	Total Overtime Cost
$26.56	800	$21,248.00	9	$191,232.00

Fulltime Reg. Rate	Class Hours	Total Payable	Employees	Total Regular Pay
$17.71	263	$4,657.73	9	$41,919.57

Part-time Reg. Rate	Class Hours	Total Payable	Employees	Total Part-time Pay
$12.00	263	$3,156.00	9	$28,404.00

Fulltime O.T. Rate	Class Hours	Total Payable	Employees	Total Overtime Cost
$26.56	526	$13,970.56	9	$125,735.04

Paramedic Class	Employees	Total for Tuition
$4,587.17	9	$41,284.53

	Qty	Cost Each	Total Monitors
Cardiac Monitors	2	$18,126.66	$36,253.32

	Misc. Supplies	Total Increase Supplies
EMS Supplies / Equip.	$5,000.00	$5,000.00

Total Funding Required	$278,596.46

APPENDIX 5 – PROJECTED STAFFING

2007 Current HFD Staffing Levels

Table 4

		Unit 1	Unit 2	Unit 3
Career Paramedics		2	2	2
Career EMT-I		3	3	3
Part-time EMT		3	3	3
	Total	8	8	8

Projected HFD Staffing Levels

Table 5

		Unit 1	Unit 2	Unit 3
Career Paramedics		5	5	5
Part-time Paramedics		2	2	2
Part-time EMT		1	1	1
	Total	8	8	8