A Cost-Benefit Analysis of Emergency Medical Service Transport for the Sterling Heights Fire Department

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Certification Statement

I hereby certify that this paper constitutes my own product, that where the language of others is set forth, quotations so indicate, and that appropriate credit is given where I have used the language, ideas, expressions, or writings of another.

Signed: _____

Abstract

The Sterling Heights Fire Department is dedicated to saving lives, whether that involves fire, disasters and accidents, or medical emergencies. The sole purpose of providing Emergency Medical Service (EMS) is to save lives. The research problems exists that the Sterling Heights Fire Department has not conducted a cost/benefit analysis for Emergency Medical Service transport. The omission of such has resulted in poor decision making to not provide this service. The purpose of this research was to apply a simple, widely used and relatively easy tool for deciding whether to make a change in the delivery of EMS from ALS engine companies to ALS transport. Descriptive research was employed to answer the following questions: (1) What are the cost benefits of each system? (2) What are the benefits of each system? (3) What are the service inputs of each system? And (4) What are the quality of life impacts of each system? Focused problem and purpose statements along with relevant research questions were developed prior to the literature review. Extensive research gathered information from local and state resources. Topic experts were also identified and interviewed. The results found that due to the nature of the fire service – responding to emergencies – makes firefighters ideally suited to EMS work; therefore, a dual-role firefighter/paramedic EMS system not only offers a substantial upgrade, but can save municipalities money by eliminating the need for duplicating the capabilities of the fire-emergency response system through a costly third service or by paying a private contractor that must account for a profit margin.

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Introduction

The Sterling Heights Fire Department (SHFD) provides fire, emergency medical and other services to the City of Sterling Heights (CoSH). Since 1968, the SHFD has provided high quality fire service to its citizens and in 1971 the fire department began providing the citizens of Sterling Heights with quality emergency medical care.

Fire departments around the country are feeling the profound impact that the economic crisis is having on fire-based Emergency Medical Service (EMS) delivery. Despite long range economic planning and development, the effect of spiraling foreclosures, with lower tax revenues causing shrinking budgets does not leave Sterling Heights impervious.

Request for EMS totals approximately 84 percent of SHFD's total calls for service (Public Library, 2011, p. 134). Most patients of medical emergencies in Sterling Heights receive their first assistance from the fire department. Medical response is an integral part of the job of Sterling Heights' firefighters and firefighters are an integral part of the health care system. Advanced Life Support (ALS) is provided by the fire department through the current staffing model utilizing a four person ALS engine company with transport provided by Universal Macomb Ambulance Service, a private for-profit owned company. When paramedic care is provided to a patient, a fire department paramedic accompanies the patient to the appropriate medical facility in the for-profit ambulance.

The problem is a cost-benefit analysis of EMS transport services for the Sterling Heights Fire Department has not been conducted. While private, for-profit ambulances can often provide

some level of care at low initial cost, it is not clear that said low cost translates to the highest value for patients and citizens over the long-term.

Should alterations in the EMS market occur because of changes in demographics, or as a result of health care reform, the ability of private, for-profit ambulance companies to recover their costs may be adversely impacted. This would result in a lesser amount of motivation to offer a high level of care.

The purpose of this research was to conduct a cost-benefit analysis (CBA) for EMS transport services for the SHFD. CBA is used in the assessment of whether a proposed project is worth doing, and involves comparing the total expected costs of each option against the total expected benefits, to see whether the benefits outweigh the costs, and by how much.

Descriptive research was used with the assistance of a local business college to assist in calculating the CBA in the following areas related to EMS transport for the CoSH; Economics, Political, Fire Protection, and EMS. To determine this impact, the following questions will be answered: (1) What are the costs associated with each system? (2) What are the benefits of each system? (3) What is the service impact of each system? And (4) What are the quality of life impacts of each system?

Background and Significance

The City of Sterling Heights is located in Macomb County, Michigan, and is one of Detroit's core suburbs. The Sterling Heights Fire Department protects the lives and property of 129,699 residents in the city’s 36.8 square miles (Public Library, 2011, p. 126). These statistics make Sterling Heights the second largest suburb in Metro Detroit and the fourth largest city in Michigan. The ethnic and racial composition of the population was 83.8% Non-Hispanic whites, 5.2% African Americans, 0.2% Native Americans, 6.7% Asians, 0.1% Non-Hispanics reporting

some other race, 2.2% two or more races and 1.9% Hispanic or Latino. The city has 52,190 housing units with 94.8% being occupied. The median age is 40.4 and there are 44,076 residents over the age of 62 (U.S. Census Bureau, 2010).

From January 1, 2010 thru December 31, 2010, the Sterling Heights Fire Department responded to 10,868 total fire department incidents. Of this total number of incidents 9,129 were EMS related, 325 were fire incidents, 135 were hazardous materials incidents, and the remaining 1,279 were classified as non-fire emergencies (Fire Department, 2010, p. 173). There has been an overall increase in the number of emergency medical runs and other incidents over the past ten years. Since 2000, medical runs have increased by 46% (Fire Department, 2010, p. 173). Emergency medical responses account for approximately 84 percent of the department's total calls for service. Most victims of medical emergencies in Sterling Heights receive their first assistance from the Department. Medical response is an integral part of the job of Sterling Heights firefighters and firefighters are an integral part of the health care system.

The Sterling Heights Fire Department operates out of five fire stations strategically located through the city. The department consists of four divisions; Administration, Extinguishment, Fire Prevention, and Training. Currently there are 96 personnel assigned to the fire department. The City of Sterling Heights operates a public/private partnership that is an advanced life support (ALS) system consisting of ALS fire department first response and ALS private-owned private ambulance transport. All fire engines in Sterling Heights are state-licensed non-transporting advanced life support vehicles and have a minimum of two firefighter/paramedics assigned to them. Transportation is provided by Universal Macomb Ambulance Service, a private for-profit owned company.

The Sterling Heights Fire Department has a long tradition of providing Emergency Medical Services to its citizens. In 1971, firefighters provided Medical First Responder (MFR) level of care. The MFR is the first medically trained responder who comes into contact with a patient. After initially stabilizing a patient, a more advanced trained responder, typically a paramedic arrives on scene to take over care and transport the patient to the closest, appropriate hospital.

In 1982, that care was improved to Emergency Medical Technician-Basic, which responded with four state-licensed Basic Life Support (BLS) fire engines, strategically located throughout the city. In addition, the fire department was the first in the county to implement the use of Automatic External Defibrillators (AEDs). This addition provided for early defibrillation capabilities to a growing population.

In 1990, EMS care again progressed in the fire department by establishing and becoming paramedics and providing Advanced Life Support (ALS). The paramedic level of prehospital provider is the highest level of prehospital care. These highly trained paramedics will often remain on the scene to begin stabilization of the patient prior to initiating transport to the hospital. Delivery of advanced life support was provided by three, transport capable but non-transporting, rescue vehicles. This increased level of service allowed the fire department the potential to transport the patient to the hospital, thus preventing delay in patient care. The fire department trained and was equipped for the delivery of such service with the anticipation of eventually providing all prehospital emergency care and transporting patients to the hospital, which was the next logical step. However, transportation of the patient continued to be held by UMAS, even though the fire department paramedics provided all patient care and accompanied the ill or injured patient to the hospital in the back of the private, for-profit ambulance.

In 1995, due to an increase in calls for EMS, the fire department took another step forward in providing more efficient field care by converting all five fire engine companies into paramedic engines. This program provides advanced level medical care in a more timely fashion to the citizens. Sterling Heights is licensed as a non-transport prehospital life support operator under Michigan law, meaning that the Paramedic Units are licensed to provide advanced life support at the scene of an emergency but not to transport patients (Michigan Public Health Code, Act 368 of 1978, Section 333.20908).

Throughout each of these changes, no revenue was generated by the fire department that provided patient care, in part because of the long history that UMAS had within the CoSH. UMAS billed the patient for transportation and ALS care, despite the majority, 98.7% of the treatment being provided by fire department paramedics (The Ludwig Group, EMS feasibility study, 2009, pg 2).

The implementation to paramedic level patient care in the early 90's and the fact that the majority of patient care was provided by fire department paramedics, only made common and financial sense for the fire department to initiate transport service. Fire department administration made several attempts to educate city administration and the local politicians to allow the fire department to takeover EMS transport service from UMAS, whereby generating a revenue stream for the city, which was untapped at that time.

In June, 2005, the City issued a request for proposals (RFP) from local ambulance companies to provide emergency ambulance and transportation services to the City in connection with its emergency response system. As part of the bid, each bidder was required to propose a per-response payment amount to the City for each call in which the City provides Fire Responder Services. This request by the City, initiated UMAS, a longstanding provider of emergency

ambulance and transport services in the City, along with several other local ambulance companies to claim the action illegal, fraudulent, and a criminal offense.

Legal analysis from the OIG opined that:

> The proposed arrangement implicates the anti-kickback statute, as the City is soliciting payment for Fire Responder Services as part of an exclusive contract to provide all emergency ambulance transport services in the City, some of which will be reimbursable under the Federal health care programs. Notwithstanding, the OIG concludes that a number of factors are present in the Proposed Arrangement that mitigate the risk of Federal health care program fraud or abuse. (OIG Advisory Opinion No. 06-06, 2006, pp. 4-5)

Even though the issuing of the OIG Advisory Opinion was favorable for the City, the City chose not to follow through with the proposed arrangement for revenue generation and payment collection from UMAS or any other ambulance service that would furnish transportation services under this proposed arrangement.

In October of 2008, the fire department contracted with The Ludwig Group, LLC to conduct a feasibility assessment to explore the possibility of providing EMS transport to further support revenue generation by the fire department. The scope of the project was designed to evaluate: (1) An examination of the budget numbers regarding expenses and revenues in anticipation of fire-based EMS transport model. (2) Recommendations that could enhance revenue or reduce expenditures if EMS transported services were provided by the Sterling Heights Fire Department.

The assessment provided by the Ludwig Group, LLC concluded that the “City of Sterling Heights could operate their fire-based EMS transport model and see financial stability within the

first year of operation" (EMS Transport Analysis, 2008, pg 2). Unfortunately, even with an unbiased, third-party evaluation, showing a substantial favorable financial revenue stream for the City, ALS transport services have not been started and remain stalled at the political level even to this date.

Confirming the goals of the U.S. Fire Administration (USFA) of: Improving the fire and emergency services' capability for response to and recovery from all hazards; and improving the fire and emergency services' professional status (United States Fire Administration [USFA], 2010, p. 42). It is the intent of this researcher to make the most of and utilize the approach of the Executive Analysis of Community Risk Reduction Course (EACRR) to lead the community in risk reduction. It is apparent that city decision makers and this EFO candidate have a different view of community risk. EACRR Unit 4: Leading Organizational and Community Change (EACRR SM, p. 4-1) and Unit 5: Organizational and Community Politics (EACRR SM, p. 5-1) have a direct correlation to this pertinent community risk-reduction issue.

Organizational change is necessary to keep pace with social, cultural, and economic changes at the local, state, and national levels. The politicians of Sterling Heights apparently are resistant to the proposed change to EMS transport. Three of seven council members have voiced concern that this proposed change in service and revenue producer would be an unnecessary change. The success of this proposed EMS transport is dependent upon strong leadership from both city and fire department administration. One important aspect toward EMS transport will be the ability to influence others both inside the city and in the community. It will be through influence and substantiated research to change and build community equity to successfully implement and reduce this community risk.

Literature Review

Pre-hospital 911 services are a key functions provided by the fire service in the United States. “Fire service-based EMS provides this pivotal public safety service while also emphasizing responder safety, competent and compassionate workers, and cost-effective operations” (IAFF, 2007). Throughout the research for this ARP topic for Fire-based EMS, a coalition comprised of five organizations consisting of the International Association of Fire Chiefs (IAFC), the International Association of Fire Fighters (IAFF), the Congressional Fire Service Institute (CFSI), the National Fire Protection Association (NFPA), and the National Volunteer Fire Council was discovered. This coalition, even though linked by their environment generally has, based on their membership makeup, strong differing opinions on services along with how the services are provided. Identifying the importance and as advocates for fire-based EMS the creation of this coalition was in response to several factors, such as the personal biased opinion by a medical doctor in Washington, DC, which sat on the Judiciary Oversight Commission for EMS, and along with the Institute of Medicine's report detailing problems with EMS and the emergency system in the U.S. In this report the fire service was hardly mentioned, although the fire service continues to be the largest provider of emergency medical care in the country. As a way to combat these negative opinions on Fire-Based EMS, one report was continually referenced while searching for information on this subject. As a method for information the IAFF’s *“Pre-hospital 9-1-1 Emergency Medical Response: The Role of the United States Fire Service in Delivery and Coordination” (The White paper),* was created.

The white paper is a 16 page report that is intended to help fire service organizations educate local, state and federal officials on the role the fire service plays in the delivery of EMS. The report looks at the history of the fire service and the role that they played with enhancing prehospital EMS, why the fire service makes sense to be the delivery model of pre-hospital medical care, and funding

dollars lost by fire departments for not providing EMS. The use of the fire service based system using cross-trained/multi-role personnel makes more sense economically and strategically. As the report enforces, the time for more mistakes to be made in medical care is when care is transferred from one provider to another.

Fire service-based emergency medical services (EMS) systems are strategically positioned to deliver time critical response and effective patient care. Whitehead (1996) writes, “More than 80 percent of paid fire departments perform some level of emergency medical care, making professional fire fighters the largest group of providers of prehospital emergency care in North America” (p. 40). Whitehead points out that “no other organization - public or private - is capable of providing prehospital emergency response as efficiently and effectively as fire departments” (p. 40). EMS begins the second a call is placed to 911. Fire department operations are geared toward a rapid response where resources are dispatched with highly skilled and trained EMS personnel to provide the first level of care. In one form or another, Whitehead continues (1996) “the fire service has been responding to medical emergencies for as long as it has been in existence” (p. 40).

As more fire departments started providing emergency medical care and then medical transport, Seymour (2010) states “citizens started calling the fire department for their EMS because they were reliable and had better response times” (p. 1). Whitehead (1996) writes, “EMS and the fire service is a perfect marriage. The geographic positioning of fire apparatus and manpower make it an obvious asset for the response to medical emergencies in which response times can mean the difference between life and death” (p. 41). Cross-trained/dual-role firefighters are trained to aggressively attack their work whether it involves a fire, a rescue, or a medical emergency. Ludwig (2008) states “It is no surprise that study after study has shown that

fire department-based prehospital emergency medical care systems are superior to other provider types" (p.36). More communities have begun to transition or are changing over to fire-based EMS systems.

Ludwig (2010) points out that "seventeen of the twenty most populated cities in the United States run fire based EMS systems" (p. 46). Compton (2006) affirms that "more than 90 percent of the nation's 31,000 fire departments deliver EMS to the public. More than 60 percent provide ALS services delivered by firefighters...arriving on engines, ladder trucks, squads, rescues, or ambulances" (p. 26). The fire department based EMS model is far more common that hospital, nonprofit, or private-sector EMS models.

The Journal of Emergency Medical Service (JEMS) conducted an in depth survey of 200 cities in 2006. The survey found "over 91% of these cities had fire-based EMS systems" (2007, p. 4). JEMS (2007) continues that "the public has high expectations for the performance of their EMS system. They demand quick, reliable and quality service, and entrust EMS leaders with doing everything possible to meet that objective" (p. 6). The fire service has a critical role to play to accomplish the goals of enhancing and furthering the goals of fire-based EMS throughout the nation. The three main goals that can be achieved to improve the integration of fire department-based EMS are:

> Using data to better validate and communicate the effectiveness of fire department-based EMS systems and working diligently to continue to improve those systems; encouraging our fire service professional and membership organizations to clearly communicate the importance of EMS as a critical component of fire department service delivery systems; and clarifying for decision makers at all levels of government and within the medical

> community the characteristic of fire department-based EMS systems.(Compton, 2006, p. 26)

Dean and Messoline (2011) state “The reality today [is] that the fire service has become the first-line medical responder in virtually every community in America...responding to all types of 911 incidents requires the fire department to not only provide EMS but also to do so under difficult or unusual circumstances (pg. 32).

The role of the fire service in the delivery of EMS according to Katz, Pepe, Persse and Paratt (2007) concluded:

> The rapid delivery of emergency medical care in the out-of-hospital environment, fire departments have the advantage of having a free-standing army ready to respond anytime and anywhere. Pre-hospital, 9-1-1 emergency response in support of community prosperity and security is one of the essential public safety functions provided by the United States fire service. Fire service-based EMS systems are strategically positioned to deliver time critical response and effective patient care and scene safety. Fire service-based EMS accomplishes this while emphasizing responder and patient safety, providing competent and compassionate workers, and delivering cost-effective operations (pg.16-17).

The rise of fire-based EMS transport has generated much discussion in the firehouse as well as in the political arena. Fire departments that provide EMS transport can generate significant revenue. The Ludwig Group’s revenue forecast for EMS transport in Sterling Heights starts at $2,391,192 and reaches $3,164,301 at seven years (Ludwig report, 2008, p.4) AccuMed, an EMS billing company based in Michigan, performs only EMS billing and has generated a revenue forecast based on EMS statistics and demographics of surrounding local, comparable

Michigan fire-based EMS transport agencies (Appendix A). Medicare is a major source of EMS transport revenue. The Medicare program was initiated by the federal government in 1965, and many EMS billing representatives believe the program will not be abandoned without an alternative revenue source (Ludwig, 2008, p. 5). An additional aspect to consider concerning revenue generation is that Michigan's no-fault insurance guarantees payment for EMS transport. Even non-insured motorists and passengers that are transported by EMS are covered under state law.

One example that solidifies fire-based EMS is that in Kansas City, MO. Metropolitan Ambulance Service Trust (MAST) was disbanded and EMS transport was taken over by the Kansas City Fire Department. The Kansas City Fire Chief said "he anticipates improved response times and a possible savings of $1.6 million" (Ludwig, 2010, p. 36). Another example of the public sector moving to a fire-based EMS system is the Orlando, FL, Fire Department. As reported in the *Orlando Sentinel*, "the traditional method in the city of the fire department providing first response and a private ambulance company doing transport will soon come to an end with a plan proposed by the fire chief and supported by the mayor" (December, 2010, para. 3). Other large cities have explored or are considering merging fire and EMS services. Cities in the last 15 years that have merged EMS into the fire department include New York City; St. Louis, MO; San Diego and San Francisco, CA; and Tallahassee, FL (Ludwig, 2010, p. 36).

An ongoing argument exists over whether government should be a provider of EMS. This debate centers on an essential philosophical question: Is EMS simply a transportation service that is not within the area of government operations, or is it part of public safety? Many differing opinions exist on this question. Fire-based EMS provides an invaluable service to the public- one that unfortunately is difficult to quantify.

The report, *Total Cost of Fire in the United States* (2011), indicated that the total cost of fire for 2007 was $347 billion, which is about 2.5% of the U.S. gross domestic product (GDP), an increase of 86% from 1980 (p. i). The total cost of fire is a combination of many factors that include the monetary losses caused by fire and the money that society spends on preventing and fighting fires. In 2007, the cost of fire included:

- $18.6 billion property fire loss
- $36.8 billion career fire departments
- $128 billion donated time of volunteer firefighters
- $17.2 billion insurance
- $61.5 billion building fire protection
- $42.4 billion monetary equivalent monetary costs for death and injuries
- $42.3 billion other economic costs

As you can see, America spends about $165 billion for fire-service labor. The fire property loss is $18.6 billion. Evans (2010) states the following:

> In this age of economic recession, the private-ambulance industry and the public could argue that spending nearly nine times the value of the property loss on firefighters might not be beneficial, i.e., compared with what it costs to staff and operate the fire service, we could save billions of dollars by letting structures burn down and paying to replace them. (para. 8)

Evans (2010) continues “that argument would be unfounded because it does not take into account the economic value of the loss that is averted as a result of fire/EMS response” (para. 10). For example, a fire loss may come to $50,000, but we saved the rest of the house, which has a market value of $350,000, resulting in a net save of $300,000. The public doesn't see that. The same goes for EMS. While it may cost $1,000 to dispatch a fire-based EMS unit to a child who

has suffered a head injury, it is sensible to think that the speedy and professional response of that unit will save years of disability and hundreds of thousands of dollars. Other non-tangible examples would be a cardiac arrest patient that received rapid treatment, living a quality life for another 25 years. These examples are seldom explained when the value of fire-based EMS is considered.

Evans aptly continues “Fire-based EMS needs to demonstrate to the public its economic value. It needs to show, as a result of its response, that it saved X lives, minimized Y injuries and thus saved Z dollars. If we had those numbers, we could justify our professional existence much better” (2010, para. 11).

Today, fires account for about 3% of what a department does (B. Bledsoe, personal communication, August 16, 2011). As a result, there is no way that the fire service can sustain itself or justify the spending levels as described above without EMS. The fire service has known this for years. EMS is needed for survival. Roberts (2010) states “With fire-call volumes down, fire departments plan to expand existing medical-response services to seal the perfect marriage between fire and EMS. But the challenge is to fund it and convince communities it’s a worthwhile, value-added service” (para. 1). “There’s no doubt about it,” Austin (as cited in Roberts, 2010) said “Good fire protection and good emergency services are a quality-of-life issue. If fire departments step up to provide medical services, it is going to improve the quality-of-life in that community” (para. 19).

Firefighters are dedicated to saving lives, regardless of the emergency. It is their mission. Whitehead (1996) fittingly states “Firefighter/EMTs and paramedics respond quickly to each and every emergency situation. Neither profits nor the ability to pay for EMS plays any role in their decision to respond, because they are America’s first responders” (p. 40).

Procedures

The technique to prepare this Applied Research Project (ARP) encompassed identifying the research problem and developing pertinent research questions applicable to this problem. A wide range of literature was reviewed along with input from issue-specific professionals in the field. Contracts, Standard Operating Guidelines (SOG's), statistics, and relevant transport studies from similar fire-based emergency service agencies were obtained for use in a compare/contrast study in relation to the Sterling Heights Fire Department (SHFD). Descriptive research proved to be the methodology that best suited the examination of the cost/benefit analysis of fire-based EMS.

This ARP began to take shape on March 28, 2011 when the author attended the EFOP's EACRR. Shortly after the completion of the EACRR, the author contacted the assigned evaluator on April 18. This contact via e-mail conveyed the author's research proposal to the evaluator for approval and any additional professional input. After the evaluators approval of all aspects of the research proposal the author needed to identify the next pertinent step and subsequent direction of the applicable research to be taken. The author decided to complete all of the required component sections of the ARP in a non-sequential order based on the direction that the research would dictate.

During the following months the author searched out and began to compile a database of fire-based emergency service information. This was culled from relevant ARP's, EMS and Fire based trade publications, and IAFF literature to serve as the foundation to support the statistics that would then form the framework of the cost/benefit analysis of fire-based EMS. A list of similar fire departments that also provide fire-based EMS was categorized, along with their policies, procedures, history, and current results of their own fire-based EMS systems. The most

productive method to research this ARP was determined to be analyzing the issues that these departments have had with the implementation of a fire-based EMS system where they have each performed their own cost/benefit analysis.

The first step was to the contact the 11 comparable cities that provide fire-based EMS transport to its citizens, along with one city that provides only city based fire protection with private business medical transport that parallels Sterling Heights, and request the information needed to compile a study to show where the Sterling Heights Fire Department falls among all of the cities surveyed. There were 12 different informational facts that needed to be provided in order to complete the survey. The following ten were provided by all of the questionnaires surveyed:

1) How many firefighters per 1,000 residents
2) How many firefighters per square mile
3) Number of EMS runs per 1,000 population
4) Number of EMS runs per firefighter
5) Number of transports per firefighter
6) Percentage of EMS runs transported
7) Number of ambulances per 1,000 population
8) Number of transports per ambulance
9) The minimum number of firefighters on an engine
10) The minimum number of firefighters at average station

The two following inquiries were answered by everyone except Sterling Heights and Grand Rapids due to their lack of fire-based EMS transport:

1) The average revenue collected per transport

2) Transport Profit/Loss

The resulting answers have supplied the numbers upon which to begin framing a proper cost/benefit analysis.

The next step in this research process was to begin compiling information from relevant literature. To begin this process the author began by using the National Fire Academy Learning Resource Center to review archived applied research projects and various periodicals. The author was also able to contact the International Association of Fire Fighters to be able to review any applicable data that would assist in the cost/benefit analysis of this project. The author roughly sketched out a chart to better categorize the data that was pulled from the numerous varied literature. This allowed the author to keep better organizational control of the information and preventing it from melding into an unusable collection of non-connected statistics. Determining the initial start-up costs was another integral piece of information that was obtained in order to provide part of the cost component of the analysis.

Subsequently, an examination of the benefits that would be realized from implementing a fire-based EMS transport system had to be categorized in order to provide the other half of the analysis equation. The benefits in this type of cost/benefit analysis can sometimes be difficult to quantify by monetary measures. The following list of benefits was compiled by interviewing firefighter union officials, fire department administration, and also city administration.

1. Greater quality control of the EMS system and advanced life support care to our citizens.
2. Uninterrupted continuity of care.
3. Fire department as a transport agency would be cost effective.
4. With the fire department as a transporting agency, citizen’s dollars spent would be reinvested back into the community for continued service level improvements.

5. Sterling Heights Fire Department members are “career” professionals with negligible turnover.
6. The greatly reduced employee turnover rate saves money and also retains many years of experience.
7. Fire based EMS systems are considered “premier” systems.
8. With the longevity of employees in a fire-based EMS system, the positive relationships between caregiver and patient are allowed to foster for citizens who have repeated contact with the EMS system, thereby allowing more personalized care of patients.

The use of the internet was a very cost effective and time efficient way of researching and compiling pertinent information for this ARP. Numerous new avenues were able to be explored quickly and efficiently whilst also keeping focused on the task at hand. The ability to access the Learning Resource Center of the National Fire Academy (NFA) in Emmitsburg, Maryland, was invaluable.

The final process in the completion of this ARP (October thru November, 2011) consisted of first gathering of all research materials from internet, face to face interviews, numerous informational requests, and personal research. Secondly, producing an organizational outline to facilitate how the information would be addressed and in what order. Next, the outline had to be expanded and written down with correct typing and formatting. Finally, after this was completed, the entire report needed to be proofread, appropriate corrections made, and report submitted to the NFA prior to the required due date.

Results

The results of this research were compiled and ultimately became the foundation for the recommendations section. These results directly influenced this researcher and will assist in

reaching the projects purpose, which was, conducting a cost-benefit analysis of EMS transport for the City of Sterling Heights.

Economic Costs

The laws relating to cost recovery recognize that municipalities are tax supported, and therefore have the ability to choose billing options while the private agencies do not. Once a billing rate has been determined, the fire department can decide to:

1. Bill the patient's insurance carrier (private or Medicare) only what insurance will pay and do not pursue the co-pay.
2. Pursue the co-pay on every patient.
3. Pursue the co-pay on non-residents only.
4. Do not bill people that are uninsured.
5. Determine how aggressive the fire department will be on collection

Of course, the less aggressive the fire department is on billing and collecting, the less money would be expected to be received. The estimates from agencies involved are based on billing the insurance companies, and billing the patient for the co-pay. Historically, private ambulance companies tell the fire department to expect a collection rate of 85% of the co-pays.

Trends

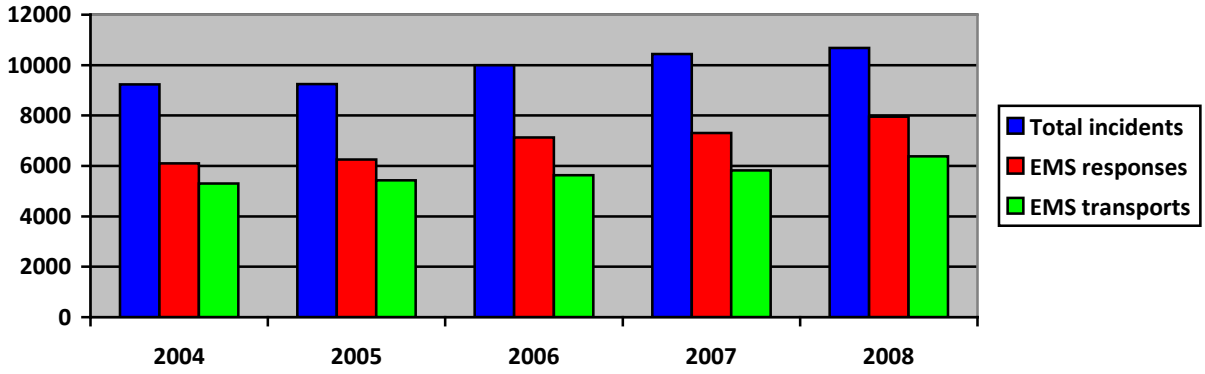

Figure 1 – SHFD Run Volume and Responses

The above graph displays the fire departments increasing run volume over a five-year period. The City of Sterling Heights' EMS statistics favor an EMS transport model. In 2007, the fire department responded to 7,307 EMS calls and 5,825 patients were transported. Out of the 2007 data collected, only the City of Dearborn transported more patients.

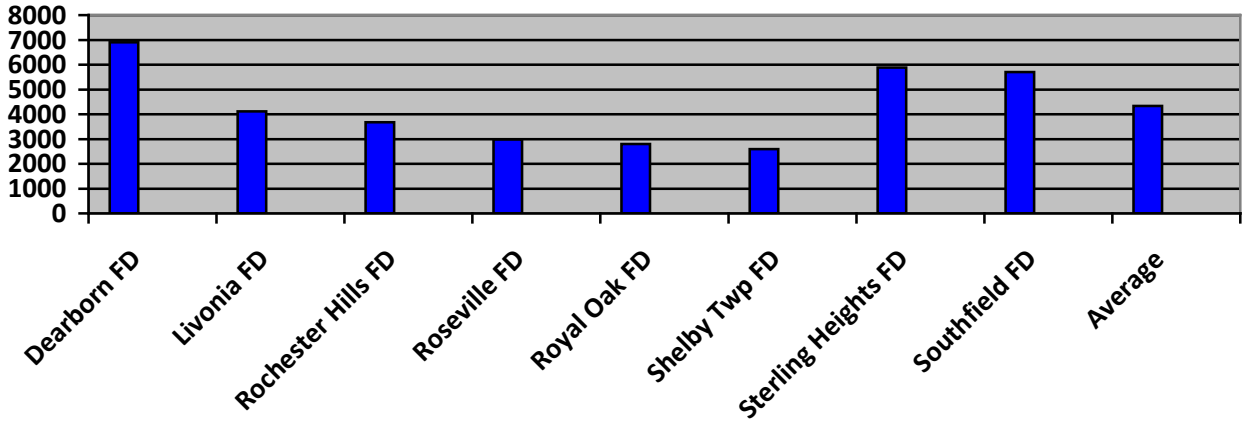

Figure 2 – Patient Transports in Comparable Communities - 2007

In 2008 the department responded to 7,550 EMS calls and 6,205 were transported to the hospital. The Ludwig Group's revenue forecast for EMS transport is starting at $2,391,192 and reached $3,164,301 at seven years (Ludwig, 2009).

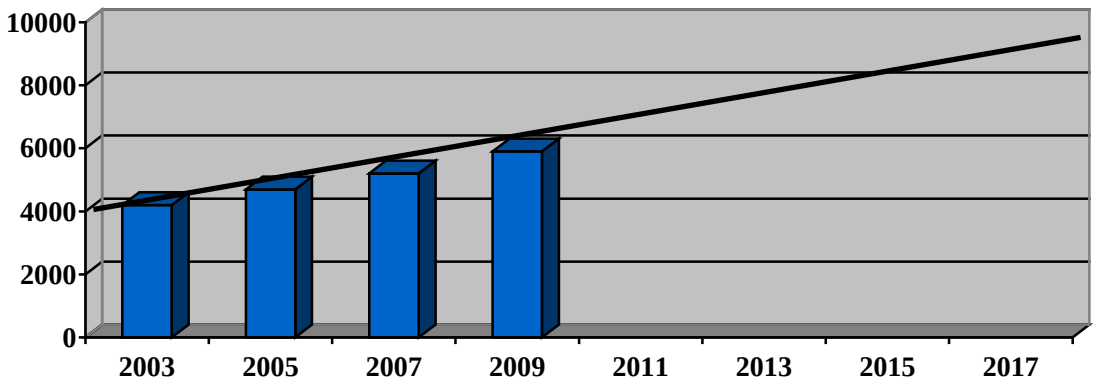

Figure 3 – Projected Transports through Year 2018

Using linear regression modeling and trending, the projected number of transports in Sterling Heights is predicted to be slightly over 8,000 in the year 2018.

Revenue Forecast

In order to determine the cost for the Sterling Heights Fire Department to operate a fire-based EMS model in the first year of operation, the following standard formulas were used for determining performance indicators, cost of hour produced, total system cost per unit hour, and cost per response. The fee charged per transport should exceed the first year cost per transport. As transports increase over subsequent years, the cost per transport should lower after the first year capital costs are no longer factored.

Performance Indicator

Unit hours produced (weekly): (Note: 168 hours in a week)

168 x 4 units available each day = 672 hours per week

6,000 projected transports for 2009 or 115 responses per week

115 responses per week divided by 672 (unit hours per week) = .17 unit hour utilization (U:UH) ratio.

Cost of Hours Produced

EMS cost of $2,017,870 divided by 52 weeks in year = $ 38,805.19 per week

Total System Cost per Unit Hour

$ 38,805.19(cost per week) divided by 672 (unit hours per week) = $ 57.74.

1st Year Cost per Transport

$57.74 (unit cost per hour) divided by .17 (U:UH) = $ 339.64.

The following demonstrates the potential revenue generation that may be realized by implementing EMS transport within the fire department. The graph illustrates the net revenue collected by various municipalities whose fire department perform EMS transport in 2007 and compares this with the potential revenue generated by the Sterling Heights Fire Department; based on 2007 patient transport numbers. This comparison is net revenue collected and is based on the billing practices and collection rates of the compared communities (Figure 4).

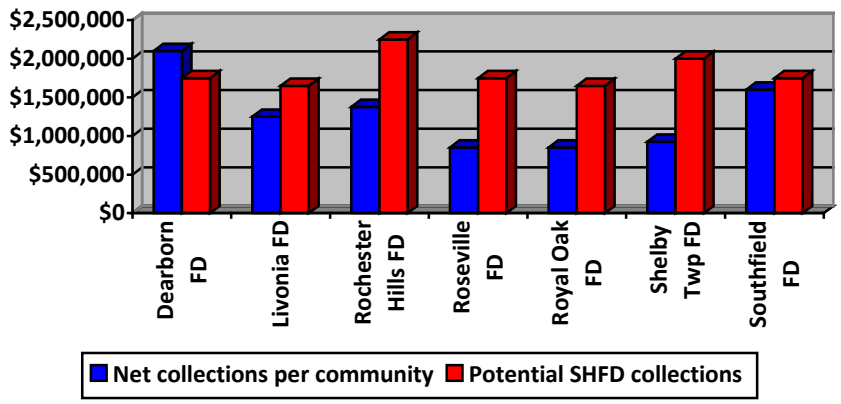

Figure 4 – Collection Rates of Comparable Communities

Revenue

Patient charges for ambulance services are determined in a number of ways. Many of the decisions are not made through logical business rationale, but are determined, limited, or impacted by local political decisions. Many ambulance services base their charges on the amount

that they expect to be reimbursed by Medicare; others have simply followed the price structure of other services within the community. However, while all of these factors may affect the ultimate charge structure, the first step in establishing a rate schedule is to clearly establish the cost of providing the service. Any business offering a product or service to consumers will base its prices on the cost of delivering those goods or services, and EMS should be no different. Only after the actual costs have been established should the positive impact of subsidization on charges be determined.

The fiscal stability of a medical transportation service is largely determined by the system structure in which it functions, its design and its characteristics. Certain key areas must be examined fully in order to evaluate the financial aspects of a system. The unique characteristics of a system include its call volume, geography, population, demographics, and density. A large population generating a high volume of patient transports allows the fixed costs of providing the services to be distributed over a larger patient base. Similarly, a given population in a small geographic area requires fewer medical transportation resources than an equal population dispersed over a large geographic area. In addition to impacting service usage, population demographics affect the ability of the service to recover revenue.

For example, revenue for a service with a high percentage of consumers more than 65 years of age will be significantly impacted by the local Medicare reimbursement policies. Additionally, lower income areas historically have a higher utilization rate for EMS than the more affluent areas. The revenues from these lower income areas tend to be significantly reduced. This directly affects utilization as well as revenue recovery potential. Even though equitable comparison of one system to another is difficult, each system does have similar associated costs that can be determined. The best method for determining anticipated revenue is

to benchmark Sterling Heights against other communities where fire departments provide EMS transport. Benchmarking examines the number of transports, gross revenue, poverty level within the community, median family income, plus other data.

Expenses

Capital expenditure including manpower and equipment would be approximately $1,900,000. Projected personnel and equipment costs associated with the current proposal averages $1,700,000 per year over the next seven years. Annual revenues of approximately $2,500,000 per year will offset the annual expenditures of the program. It is estimated that the net revenue generated over a seven year period would be approximately $7,000,000. This is inclusive of all personnel costs (including benefits), supplies and equipment, and capital costs.

The Finance Director for the City of Sterling Heights prepared a cost analysis for the expected capital expenditures required for SHFD to take on EMS transport. This analysis was presented in the agenda items for the May 17, 2011 City Council Meeting. This also included expenses that the city would incur for needed items not part of the purchase of the ambulances (City of Sterling Heights, May 17, 2009, p. 284).

Political Dilemma

Politicians in Sterling Heights view fire-base EMS as a win/win deal for which they can take credit, and enhance the fire departments current service delivery system by providing emergency response redundancy in each response district. Despite this new source of revenue generation for the City, some members of City Council continue to remain cautious and apprehensive about the implementation of EMS transport and the potential outcry from a few vocal residents that oppose EMS transport. At the time of submission of the ARP, City Council

officials after numerous updated statistical data information, continue to place this revenue generating program on hold.

Cost Effectiveness

It is important to recognize that the current EMS delivery system isn't necessarily a "bad" system; it does not provide for any revenue generation for the City, even though fire department personnel provide 95% of EMS patient care to the residents. Fire service-based EMS brings the treatment to the patient, wherever they are. The fire department is geographically deployed throughout the community to minimize response times. Response time is the priority for medical emergencies. Ludwig (2010) states "Firefighters are in the best position to respond quickly and provide vital services. Treatment by firefighters begins immediately, even if the patient is trapped in a building that's on fire, pinned in a car crash, or in a collapsed structure" (p. 36). The provision of EMS response, treatment, and transportation by firefighters is seamless. One agency is responsible for the continuity of patient care and provides EMS within an "all-hazards" response model. The fire service EMS deployment model is more robust than any private for-profit ambulance-based EMS model. Firefighters are deployed and ready to respond to any type of emergency (Whitehead, 1996, pg. 41).

Discussion

The results of this research confirm that more and more communities are recognizing the added value that a fire-based EMS system can provide to its residents. The fiscal stability of a medical transportation service is largely determined by its design, its characteristics, and the system in which it functions. The unique characteristics of a fire-based EMS system include its call volume, geography, population, demographics, and density. A large population generating a high volume of patient transports allows the fixed costs of providing the services to be

distributed over a larger patient base. Similarly, a given population in a small geographic area requires fewer medical transportation resources that an equal population dispersed over a large geographic. Greiff (1999) states “Fire service participation in EMS is a growing trend across the country...Improved statistics show that combined services are better than stand alone EMS operations” (pg. 44). While some stakeholders desire the fire department to enter into a fire-based transport system, the literature review identified both positive and negative considerations. In order to reach a conclusion as to the desirability of a project, such as fire-based EMS transport, all aspects of the project, both positive and negative, must have a bottom line. This program may provide benefits which are not directly expressed in terms of dollar amounts. The research supports the assessment of benefits and costs showing improvement in one area as saving time in the area of transporting a sick or injured victim. Ludwig (2010) supports this statement in that “more localities recognize the need to improve response times and eliminate duplication of services” (pg. 36). Whitehead (1996) defined the fire service as “a good fit to deliver emergency medical transport...firefighters’ skills and attitudes as well as the strategic locations of fire stations were benefits that support fire-based EMS” (pg. 41).

Emergency medical services (EMS) have been a significant part of most fire departments for as long as most current members have been in the service. Although relatively new, considering the origins of the fire service, EMS has been part of the responsibilities of many firefighters since they signed on. Yet EMS and its role in the fire service continue to be questioned on some fronts. Another reason cited for the fire service’s venture into EMS is productivity. Marinucci (2011) states:

> Communities experienced a decrease in fire calls, and some people thought it would be a good use of personnel to treat the sick and injured. You can still hear people say that fire

> departments engage in EMS to justify their full-time positions because they don't have enough fire activity. I am not convinced that this is the real reason. (para. 3)

As an integral part of the overall healthcare system, EMS systems and their underlying missions are being reshaped by evolving market forces, expanding needs, changing community expectations and a broadening perspective of health.

Brown and Devine (2008) support that:

> EMS systems offer universal access (anyone can call for an ambulance at any time for any reason) and equitable resource availability (the same equipment and same personnel are dispatched to every "possible stroke" that occurs in a community, regardless of whom the patient is, where the patient lives, or how well insured that patient is), embodying the concept of enabling. (pg. 3)

There are restrictions in this research that need to be mentioned. It is difficult to provide concrete numbers related to the potential earnings from transporting patients to the hospital. Factors used by The Ludwig Group in determining the estimate of anticipated revenues, included, but were not limited to, the median income of the residents, number of residents living below the poverty level, reimbursement rates from Medicare and private insurance companies, and number of transports. Despite this comprehensive approach to estimating the anticipated revenue, this researcher chose to use the average from the surveyed fire departments, as some members of city council believe the proposed figures to be outdated due to current economic conditions.

The literature review and research solidifies and clearly supports that the fire service should be providing EMS. Furthermore, each municipality or jurisdiction should strive to provide the best fire-based EMS service to its residents. Ultimately, whether fire-based EMS is

considered a public or private good will be determined by the public-policy process, with the decision rendered by elected officials. Thiel (2011) contents “It’s also important to note that many public-policy decisions are made to address social and ethical considerations beyond economics” (pg. 18).

Fire-based EMS has much strength which could be beneficial to the citizens of Sterling Heights. Help must arrive early, provide sound medical practice and show evidence of economic prudence. The mission of the fire service is guided by the philosophy that supports the protection and preservation of life and provides for a commitment to care for the sick and injured. Fire-based EMS demonstrates competent care of the patient. Training, certification, quality control and continuing education are routine for the fire service. The fire service has the capability to provide extensive services that interconnect and complement the EMS role. Finally, the use of multi-skilled personnel allows for a cost effective service from the 911 call being placed, until arrival at a hospital.

Finally, if you told a firefighter in Sterling Heights, that he wasn’t going to provide EMS, he wouldn’t understand what you were talking about.

Recommendations

The City of Sterling Heights is not unique when it comes to financial problems brought on by the economic conditions over the past several years. Fire departments nationwide are facing budget cuts as cities look to balance their budgets by cutting public safety, but at what cost? These are hard decisions for politicians to make, but it is up to the fire service leaders to make sure they are educated decisions.

Politicians and residents alike are largely uneducated when it comes to what the fire service offers, and what it needs to properly operate. This leads to a lack of understanding how

cuts will affect the service we provide. It should go without saying that each resident wants nothing but the best service possible during their emergency, but may balk at the cost of providing that same service to everyone else.

While some may argue that the collection of fees by fire departments for patient transportation is a form of double dipping the tax payer, many departments have been successful in using this revenue to either maintain or increase staffing. It would seem a logical approach for municipalities to use such fees, in lieu of increasing taxes, to keep adequate staffing for their fire department.

Should the transition to the EMS transport model take place, the city would see significant revenue generation as well as beneficial changes in patient care. The anticipated benefit to patient care comes in the fact that care will be provided by professional firefighters during the entire incident, instead of the current tiered system that has the fire department transferring care of the patient to the private ambulance company.

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Sterling Heights Fire Department
Anticipated expenses for EMS transport

	cost	qualitity	total
Neiderman System	$12,500.00	2	$25,000.00
Add'l portable radio batteries	$75.00	12	$900.00
Vehicle portable radio charger	$400.00	6	$2,400.00
Vehcile VHF radio	$600.00	6	$3,600.00
MDC's (all hardware included)	$5,500.00	6	$33,000.00
Verizon Airtime (yearly)	$500.00	6	$3,000.00
Oxygen	$14.00	9	$126.00
NWS mobile licensing	$1,600.00	6	$9,600.00
NWS maintenance agreement	$1,536.00	1	$1,536.00
State Licensing fees	$25.00	6	$150.00
Oxygen cylinder lift	$800.00	1	$800.00
EMS supplies	$4,250.00	6	$25,500.00
Ambulance Quote*	$176,000.00	6	$1,056,000.00

Total costs of equipment/computers/sta. upgrades		$105,612.00
Total equipped ambulances		$1,056,000.00
	Total	**$1,161,612.00**

Ambulace quote includes the following equipment: Stretcher, LP 15 cardiac monitor, cardiac monitor battery charger, suction unit, stair chair, (2) portable radios, (1) 800 mega-hertz vehicle radio

Finance & Budget note:

The above costs do NOT include:
Fuel
Vehicle and equipment maintenance costs
Training costs
Legal costs
Liability and auto insurance
Vehicle sanitizing services
Medical billing fees

city of STERLING HEIGHTS

Interoffice Memorandum

Date: May 12, 2011

To: Mark D. Vanderpool, City Manager

From: Brian Baker, Finance & Budget Director

Subject: **Updated Fire Survey**

Attached is a fire staffing survey of surrounding and comparable benchmark communities as requested by the City Council. The survey has been updated to include whether each community believes it is making a profit or loss from ambulance transport. All communities know their transport revenues. However, most who have been providing transport for years, find it difficult to estimate how much of their staff time is devoted to transporting versus other fire related duties.

I draw the following conclusions from the study:

1. Sterling Heights is low staffed, but we also have a below average number of medical runs. Of course, Sterling Heights is also low staffed in all City departments.

2. All but two of the surveyed cities transport. Sterling Heights and Grand Rapids do not transport.

3. If we transported without adding additional staff, we would be operating within the range of station and engine staffing levels at many other cities. In fact, four cities transport with fewer minimum full-time staffing levels. However, this also raises the question that if we could begin transporting without adding staff, could we likewise decrease our minimum staffing levels through attrition and save money by continuing to not transport? In addition, we have not fully investigated the service impact of transporting without adding additional personnel.

4. Half of the cities surveyed have greater flexibility in how they operate. This is probably the more important conclusion from the study. For example, some cities do not have a minimum number of personnel assigned to a specific vehicle. Some have the option of shutting down a vehicle or redirecting staff to other stations should they fall below minimum staffing levels. In addition, one city uses "paid on call" part-time firefighters (Farmington Hills). Sterling Heights currently does not have any of these options or flexibilities in its labor contract. As a result, even under the best of circumstances, these flexibility changes should be considered in a new collective bargaining agreement prior to a decision on transport.

Should you have any questions or need additional information, please do not hesitate to contact me at your convenience.

FIRE STAFFING & TRANSPORT SERVICES
SURVEY OF COMPARABLE & LOCAL CITIES

FIREFIGHTERS PER 1,000 POPULATION
Average = 1.0

1.	Fraser*	2.7
2.	Southfield	1.3
3.	Dearborn	1.2
4.	Grand Rapids	1.1
5.	Harrison Township	1.1
6.	Warren	0.9
7.	Shelby Township	0.8
8.	Livonia	0.8
9.	St Clair Shores	0.8
10.	Roseville	0.7
11.	Eastpointe	0.7
12.	Sterling Heights	0.7
13.	Farmington Hills**	0.5

FIREFIGHTERS PER SQUARE MILE
Average = 3.6

1.	Fraser*	9.3
2.	Dearborn	4.9
3.	Grand Rapids	4.8
4.	Eastpointe	4.7
5.	St Clair Shores	3.8
6.	Roseville	3.5
7.	Warren	3.4
8.	Southfield	3.2
9.	Sterling Heights	2.4
10.	Livonia	2.1
11.	Harrison Township	1.8
12.	Shelby Township	1.7
13.	Farmington Hills**	1.3

EMS RUNS PER 1,000 POPULATION
Average = 78

1.	Southfield	140
2.	Roseville	97
3.	St Clair Shores	84
4.	Fraser	84
5.	Eastpointe	80
6.	Dearborn	76
7.	Warren	75
8.	Livonia	70
9.	Harrison Township	68
10.	Grand Rapids	67
11.	Sterling Heights	60
12.	Farmington Hills	59
13.	Shelby Township	53

EMS RUNS PER FIREFIGHTER
Average = 85

1.	Roseville	131
2.	St Clair Shores	111
3.	Farmington Hills**	110
4.	Southfield	108
5.	Eastpointe	108
6.	Livonia	89
7.	Sterling Heights	86
8.	Warren	85
9.	Shelby Township	64
10.	Harrison Township	62
11.	Dearborn	62
12.	Grand Rapids	59
13.	Fraser*	31

TRANSPORTS PER FIREFIGHTER
Average = 61

1.	Roseville	89
2.	Farmington Hills**	85
3.	St Clair Shores	78
4.	Eastpointe	72
5.	Sterling Heights (private)	71
6.	Warren	70
7.	Southfield	63
8.	Grand Rapids (private)	53
9.	Livonia	51
10.	Dearborn	48
11.	Shelby Township	47
12.	Harrison Township	42
13.	Fraser*	20

% OF EMS RUNS TRANSPORTED
Average = 72%

1.	Grand Rapids (private)	90%
2.	Warren	83%
3.	Sterling Heights (private)	82%
4.	Farmington Hills	78%
5.	Dearborn	77%
6.	Shelby Township	74%
7.	St Clair Shores	70%
8.	Harrison Township	68%
9.	Roseville	67%
10.	Eastpointe	67%
11.	Fraser	62%
12.	Southfield	58%
13.	Livonia	57%

*Fraser - Public Safety Department
**Farmington Hills number does not include 80 paid on call FF's.
Note: S.H. & Grand Rapids use private transport companies.

5/12/11

FIRE STAFFING & TRANSPORT SERVICES
SURVEY OF COMPARABLE & LOCAL CITIES

AMBULANCES PER 1,000 POPULATION

Average = 0.06

1.	Harrison Township	0.12
2.	Fraser	0.07
3.	Eastpointe	0.06
4.	Farmington Hills	0.06
5.	Southfield	0.06
6.	Livonia	0.05
7.	St Clair Shores	0.05
8.	Shelby Township	0.05
9.	Roseville	0.04
10.	Grand Rapids (private)	0.04
11.	Dearborn	0.04
	Sterling Heights (FF Proposal)	0.04
12.	Sterling Heights (private)^	0.03
13.	Warren	0.03

AVG REVENUE COLLECTED PER TRANSPORT

Average = $319

1.	Farmington Hills	$397
2.	Fraser	369
3.	Shelby Township	363
4.	Southfield	348
5.	Livonia	334
6.	Dearborn	310
7.	Harrison Township	305
8.	Eastpointe	304
9.	St Clair Shores	300
10.	Roseville	258
11.	Warren**	222

Sterling Heights = $319 avg x 6,378 transports = $2.0 million

MINIMUM # OF FIREFIGHTERS ON AN ENGINE

Average = 2.6

1.	Grand Rapids" (private)	4
2.	Sterling Heights (private)	4
3.	Fraser	3
4.	Roseville	3
5.	Warren	3
6.	Dearborn	2-3
7.	Eastpointe*"	2
8.	Farmington Hills*"	2
9.	Harrison Township*"	2
10.	Livonia"	2
11.	St Clair Shores	2
12.	Shelby Township"	2
13.	Southfield	2
	Sterling Heights (FF Proposal)	2

*Firefighters are not assigned to vehicles.
**Warren revenue is understated due to collection lag-time for start-up year. Not all ambulances were put into service at once.
"Some vehicles are shut down if under minimum staffing.

TRANSPORTS PER AMBULANCE

Average = 1,322

1.	Warren	2,084
2.	Sterling Heights (private)^	1,595
3.	Roseville	1,550
4.	Southfield	1,462
5.	Dearborn	1,450
6.	Grand Rapids (private)	1,418
	Sterling Heights (FF Proposal)	1,276
7.	St Clair Shores	1,167
8.	Eastpointe	863
9.	Livonia	772
10.	Fraser	759
11.	Farmington Hills	734
12.	Shelby Township	722
13.	Harrison Township	381

MINIMUM # OF FIREFIGHTERS AT AVG. STATION (Includes Staffing of Engines & Ambulances)

Average = 3.8

1.	Dearborn	5
2.	Roseville	5
3.	Warren	5
4.	Eastpointe	4
5.	Grand Rapids (private)	4
6.	Livonia	4
7.	St Clair Shores	4
8.	Southfield	4
9.	Sterling Heights	4
10.	Fraser	3
11.	Harrison Township	3
12.	Shelby Township	3
13.	Farmington Hills	2

TRANSPORT PROFIT/LOSS

1.	Farmington Hills+	Profit
2.	Livonia	Profit
3.	Roseville~	Profit
4.	Shelby Township	Profit
5.	Fraser~	Even
6.	Harrison Township	Even
7.	Southfield	Even
8.	Warren	Even
9.	Dearborn	Loss
10.	Eastpointe	Loss
11.	St Clair Shores	Loss

Note: S.H. & Grand Rapids use private transport companies.
^S.H. assumes avg. of 4 ambulances. Contract minimum is 2.5.
~Fraser & Roseville includes ambulance fees and millage.
+Farmington Hills includes 80 paid on call FF's.

AMBULANCE TRANSPORT
SURVEY OF COMPARABLE & LOCAL CITIES

5/12/11

Indicator	Fraser	Southfield	Dearborn	Grand Rapids	Harrison Township	Warren	Shelby Township	Livonia	St. Clair Shores	Roseville	Eastpointe	Sterling Heights	Farmington Hills
Extinguishment FF per 1,000 Population	**2.7**	**1.3**	**1.2**	**1.1**	**1.1**	**0.9**	**0.8**	**0.8**	**0.8**	**0.7**	**0.7**	**0.7**	**0.5**
Population	*14,480*	*71,739*	*98,153*	*188,040*	*24,587*	*134,056*	*73,804*	*96,942*	*59,715*	*47,299*	*32,442*	*129,699*	*79,740*
# of Firefighters	*39*	*93*	*121*	*214*	*27*	*119*	*61*	*76*	*45*	*35*	*24*	*90*	*43*

Indicator	Fraser	Dearborn	Grand Rapids	Eastpointe	St. Clair Shores	Roseville	Warren	Southfield	Sterling Heights	Livonia	Harrison Township	Shelby Township	Farmington Hills
Extinguishment FF per Square Mile	**9.3**	**4.9**	**4.8**	**4.7**	**3.8**	**3.5**	**3.4**	**3.2**	**2.4**	**2.1**	**1.8**	**1.7**	**1.3**
Square Miles	*4.2*	*24.5*	*45.0*	*5.1*	*12.0*	*9.9*	*34.5*	*28.8*	*36.8*	*36.0*	*14.8*	*35.5*	*33.8*
# of Firefighters	*39*	*121*	*214*	*24*	*45*	*35*	*119*	*93*	*90*	*76*	*27*	*61*	*43*

Indicator	Southfield	Roseville	St. Clair Shores	Fraser	Eastpointe	Dearborn	Warren	Livonia	Harrison Township	Grand Rapids	Sterling Heights	Farmington Hills	Shelby Township
EMS Runs per 1,000 Population	**140**	**97**	**84**	**84**	**80**	**76**	**75**	**70**	**68**	**67**	**60**	**59**	**53**
Population	*71,739*	*47,299*	*59,715*	*14,480*	*32,442*	*98,153*	*134,056*	*96,942*	*24,587*	*188,040*	*129,699*	*79,740*	*73,804*
# of EMS Runs	*10,067*	*4,595*	*5,013*	*1,215*	*2,593*	*7,500*	*10,085*	*6,760*	*1,680*	*12,601*	*7,745*	*4,707*	*3,913*

Indicator	Roseville	St. Clair Shores	Farmington Hills	Southfield	Eastpointe	Livonia	Sterling Heights	Warren	Shelby Township	Harrison Township	Dearborn	Grand Rapids	Fraser
EMS Runs per Extinguishment FF	**131**	**111**	**110**	**108**	**108**	**89**	**86**	**85**	**64**	**62**	**62**	**59**	**31**
# of Firefighters	*35*	*45*	*43*	*93*	*24*	*76*	*90*	*119*	*61*	*27*	*121*	*214*	*39*
# of EMS Runs	*4,595*	*5,013*	*4,707*	*10,067*	*2,593*	*6,760*	*7,745*	*10,085*	*3,913*	*1,680*	*7,500*	*12,601*	*1,215*

Indicator	Roseville	Farmington Hills	St. Clair Shores	Eastpointe	Sterling Heights	Warren	Southfield	Grand Rapids	Livonia	Dearborn	Shelby Township	Harrison Township	Fraser
Transports per Extinguishment FF	**89**	**85**	**78**	**72**	**71**	**70**	**63**	**53**	**51**	**48**	**47**	**42**	**20**
# of Transports	*3,100*	*3,672*	*3,500*	*1,725*	*6,378*	*8,335*	*5,846*	*11,340*	*3,861*	*5,800*	*2,889*	*1,144*	*759*
# of Firefighters	*35*	*43*	*45*	*24*	*90*	*119*	*93*	*214*	*76*	*121*	*61*	*27*	*39*

Indicator	Grand Rapids	Warren	Sterling Heights	Farmington Hills	Dearborn	Shelby Township	St. Clair Shores	Harrison Township	Roseville	Eastpointe	Fraser	Southfield	Livonia
% of EMS Runs Transported	**90%**	**83%**	**82%**	**78%**	**77%**	**74%**	**70%**	**68%**	**67%**	**67%**	**62%**	**58%**	**57%**
# of Transports	*11,340*	*8,335*	*6,378*	*3,672*	*5,800*	*2,889*	*3,500*	*1,144*	*3,100*	*1,725*	*759*	*5,846*	*3,861*
# of EMS Runs	*12,601*	*10,085*	*7,745*	*4,707*	*7,500*	*3,913*	*5,013*	*1,680*	*4,595*	*2,593*	*1,215*	*10,067*	*6,760*

AMBULANCE TRANSPORT
SURVEY OF COMPARABLE & LOCAL CITIES

5/12/11

Indicator	Harrison Township	Fraser	Eastpointe	Farmington Hills	Southfield	Livonia	St. Clair Shores	Shelby Township	Roseville	Grand Rapids	Dearborn	Sterling Heights	Warren
Ambulances per 1,000 Population	**0.12**	**0.07**	**0.06**	**0.06**	**0.06**	**0.05**	**0.05**	**0.05**	**0.04**	**0.04**	**0.04**	**0.03**	**0.03**
Population	*24,587*	*14,480*	*32,442*	*79,740*	*71,739*	*96,942*	*59,715*	*73,804*	*47,299*	*188,040*	*98,153*	*129,699*	*134,056*
# of Ambulances	*3*	*1*	*2*	*5*	*4*	*5*	*3*	*4*	*2*	*8*	*4*	*4**	*4*

**Sterling Heights assumes an average of 4 ambulances (private). Contract is a minimum of 2.5.*

Indicator	Warren	Sterling Heights	Roseville	Southfield	Dearborn	Grand Rapids	St. Clair Shores	Eastpointe	Livonia	Fraser	Farmington Hills	Shelby Township	Harrison Township
Transports per Ambulance	**2,084**	**1,595**	**1,550**	**1,462**	**1,450**	**1,418**	**1,167**	**863**	**772**	**759**	**734**	**722**	**381**
# of Transports	*8,335*	*6,378*	*3,100*	*5,846*	*5,800*	*11,340*	*3,500*	*1,725*	*3,861*	*759*	*3,672*	*2,889*	*1,144*
# of Ambulances	*4*	*4**	*2*	*4*	*4*	*8*	*3*	*2*	*5*	*1*	*5*	*4*	*3*

**Sterling Heights assumes an average of 4 ambulances (private). Contract is a minimum of 2.5.*

Indicator	Farmington Hills	Fraser	Shelby Township	Southfield	Livonia	Dearborn	Harrison Township	Eastpointe	St. Clair Shores	Roseville	Warren
Avg Revenue Collected per Transport	**$397**	**$369**	**$363**	**$348**	**$334**	**$310**	**$305**	**$304**	**$300**	**$258**	**$222**
# of Transports	*3,672*	*759*	*2,889*	*5,846*	*3,861*	*5,800*	*1,144*	*1,725*	*3,500*	*3,100*	*8,335*
Total Revenue Collected	*$1,456,000*	*$280,000*	*$1,049,300*	*$2,035,500*	*$1,291,300*	*$1,800,000*	*$348,900*	*$525,200*	*$1,051,000*	*$800,000*	*$1,847,400**

**Warren - revenue collected was for a start-up year, which would cause revenue to be understated due to a lag-time in collections the first year. Also, not all ambulances were put into service at once.*

Indicator	Grand Rapids	Sterling Heights	Fraser	Roseville	Warren	Dearborn	Eastpointe	Farmington Hills	Harrison Township	Livonia	St. Clair Shores	Shelby Township	Southfield
Minimum # of Staff on an Engine	**4**	**4**	**3**	**3**	**3**	**2-3**	**2**	**2**	**2**	**2**	**2**	**2**	**2**

Indicator	Dearborn	Roseville	Warren	Eastpointe	Grand Rapids	Livonia	St. Clair Shores	Southfield	Sterling Heights	Fraser	Harrison Township	Shelby Township	Farmington Hills
Minimum # of FT Staff at Avg Station	**5**	**5**	**5**	**4**	**4**	**4**	**4**	**4**	**4**	**3**	**3**	**3**	**2**

Indicator	Farmington Hills**	Livonia	Roseville*	Shelby Township	Fraser*	Harrison Township	Southfield	Warren	Dearborn	Eastpointe	St. Clair Shores
Transport Profit/Loss	**Profit**	**Profit**	**Profit**	**Profit**	**Even**	**Even**	**Even**	**Even**	**Loss**	**Loss**	**Loss**

**Fraser & Roseville - includes ambulance fees and millage.*

***Farmington Hills - includes 80 paid on call FF's.*