

**“Emergency Medical Service Training,
Education, and Response for
Bloomington Township Fire Department”**

**Analytical Approaches to Public Fire Protection
32 FST 381**

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Introduction

The fire service in Indiana has a long standing tradition of quality service to the citizens that we protect. Like services in other states, we are constantly forced to react to new federal and state statutes, as well as those imposed on us by 20th century realities, particularly the possibilities of terrorism. As we focus more on these new issues, budgeted funds, and training are increasingly shifted in order to address the problems. Due to these new concerns, we are now training for the minutely possible, and ignoring the routinely inevitable.

The Bloomington Township Department of Fire and Emergency Services (BTDF&ES) was founded in 1970 as a combination department and remains a combination department today with a total membership of 47 personnel. The department, located in rural Monroe County, responds to emergencies in unincorporated Bloomington Township. Under contractual agreement, the department also responds to calls as the primary service provider in Washington and Benton Townships. The total population within the fire protection area is 11,665. The total area covered for fire, EMS and rescue services is approximately 136 square miles. In addition, the department provides mutual aid to all other fire departments in Monroe County, including the City of Bloomington, Town of Ellettsville, Van Buren Township and, Perry/Clear Creek fire protection district.

The Bloomington Township Fire Department is the Indiana Homeland Security (IDHS) District 8 hazardous materials response team and responds to all hazardous materials incidents in a 7 county area. Additionally, the fire department operates a regional training center for all types of fire, rescue, and hazardous materials education.

Problem

The problem identified for this paper is that the Bloomington Township Fire Department does not have a plan in place to address current deficiencies in Emergency Medical Service training and subsequent delivery to constituents.

Purpose

The purpose of this paper is to evaluate customer needs and analyze response data, in order to identify specific deficiencies in current training programs and in the overall emergency medical services being delivered to the constituents served by Bloomington Township Fire Department. After analyzing data recommendations will be made for changes necessary to improve service delivery and provide for future training and development.

Discussion

As a rural county Fire Department, Bloomington Township was the first department to offer first response emergency medical services. This trend continued throughout the years with personnel being upgraded to the level of EMT, and becoming equipped with defibrillators in 1992. Since that time, little has been done to continue upgrading EMS training.

The EMS system in Monroe County consists of several fire departments which provide BLS first response medical care. Transport services are provided by the Bloomington Hospital Ambulance Service which is an ALS provider. While fire departments within the county are located according to population and geography, ambulances are located based on call volume. Because ambulance call volume includes non-emergency as well as emergency responses, two of the three full-time (24hr.) ambulances and both of the part-time (8hr & 10hr) ambulances are positioned within the city limits of Bloomington. In the end, this often results in lengthy ambulance response times. When consulting the ambulance service, they report an average

response time of around eight minutes. Obviously, the larger volume of calls within the city limits skews the numbers towards this figure.

In order to get a better idea of what responses look like within the Bloomington Township response area, department records from 2003 through 2006 were analyzed, and data was compiled. After analyzing the data a big difference in the reported response times is obvious. In fact, Bloomington Township averages being on the scene for nearly 8 minutes prior to the arrival of an ALS ambulance (Figure 1).

Figure 1

	Fire (%)	Other	Total Responses	EMS & Rescue	Potential ALS Calls (%)	Avg. Time in min. prior to ALS	% of EMS Calls
2003	107 (14%)	121	744	516	353 (47%)	7.5	69%
2004	93 (14%)	179	679	407	271 (40%)	8.2	58%
2005	88 (13%)	188	689	413	263 (38%)	7.8	58%
2006	75 (11%)	220	685	390	280 (40%)	8.3	52%

Average Scene Time Prior to Ambulance Arrival 7.95 minutes

Figure 1 shows the total number of annual responses. This total is then broken down into Fire, Other, and EMS and Rescue calls. Other Responses include all false alarms, good intent responses, etc. The EMS and Rescue category includes all motor vehicle accidents, and medical alarms as well as technical rescue and hazardous materials responses. In addition, EMS and

Rescue responses were broken down to identify potential Advanced Live Support Calls. For the purpose of this research, ALS call types include:

- Motor Vehicle Accidents
- Cardiac Arrest/Chest Pain
- Shortness of Breath/Difficulty Breathing
- Altered Level of Consciousness
- Diabetic Emergencies
- Anaphylactic Shock
- Seizure
- Other Major Trauma (Falls > 6', Fluid Loss, etc.)
- Hazardous Materials Responses

On average, calls with the potential need for ALS care account for 41% of the department's annual responses while fire responses account for an average of 13% (Figure 2). In stark contrast to these figures are those posted in departmental training records which indicate that approximately 75% of all training sessions address fire and hazardous materials related topics, while a mere 25% of trainings cover EMS.

“The recent advances in resuscitative medical care, particularly in cardiac emergencies, we now know that what occurs in the first few minutes after onset of the medical emergency will change the long term outcome. In many of these critical circumstances, what happens on-scene determines whether the patient lives or dies. Therefore, rapid, efficient and effective delivery of emergency response and care is dependent on immediately sending nearby trained personnel to the scene of an emergency regardless of the vehicle or mode of transportation.” (Pratt et.al.,2007)

As stated above, getting the highest level of trained emergency services personnel on the scene quickly, yields the best possible outcome for the patient in distress. It is imperative that the fire department remain focused on “life safety” even during EMS response.

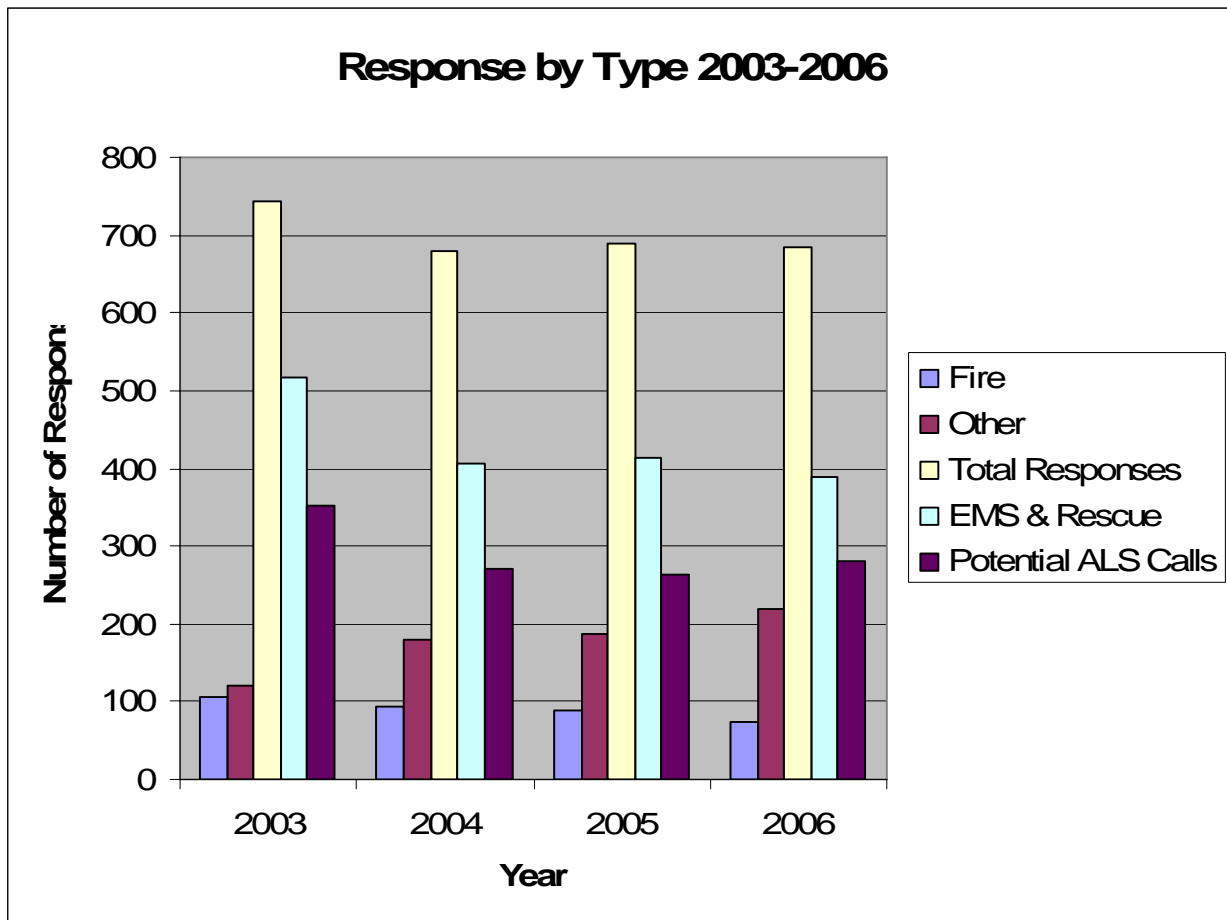
Another noted area of difficulty was in ambulance response to fire and hazardous materials scenes. Currently, it is often the case that an ambulance does not respond to fire or hazardous materials scenes. The fire department is frequently tasked with providing medical monitoring and care for its own personnel.

With regards to hazardous materials, ambulance personnel are not well-versed in these emergencies, receiving only the minimums required for state level certification. Again, the fire department is in a unique position as pointed out by (Pratt et.al.,2007):

“fire service Haz-Mat teams are the front-line of protection and rapid delivery of medical care can be pre-empted by such chem-bio threats, but where rapid care can be given, it can be expedited directly by cross-trained fire-service Haz-Mat care providers.”

It is essential that changes are made in order to care for department personnel.

Figure 2



After analyzing the available information and departmental data, several problems were identified. These problems are:

- Long response times for ALS ambulances into the response area resulting in extended scene times without the presence of ALS care on scene. And subsequent failure to provide optimum care to patients.
- Lack of ALS personnel and care on the scene of some fire ground and hazardous materials operations.
- Yearly training which fails to account for the reality of actual responses. Specifically, a high volume of medical calls versus fire calls.

Recommendations

“Fire service-based emergency medical services (EMS) systems are strategically positioned to deliver time critical response and effective patient care” (Pratt et.al.,2007). The Bloomington Township Fire Department is no different. The station is located such that responders are on scene as quickly as possible. Uniquely, the department is also ideally situated to provide more advanced medical care than is currently being offered. In order to address the concerns highlighted by this research the following changes are recommended:

- Implement changes in Emergency Medical training including: upgrading personnel to ALS level care particularly EMT-Intermediate.
- Train current department instructors as Primary Instructors in order to ensure continuing education for department members
- Acquire necessary equipment for the provision of ALS to constituents, as well as equipment for continuing education.

- Modify department response protocols to include ALS ambulance response to all fire and hazardous materials scenes when possible.
- Re-evaluate annual training to focus more on EMS.

Cost/Benefit

Costs to implement the proposed changes include the costs of course work, as well as insurance, program maintenance, and equipment. The following is a breakdown of program costs:

- \$50,000 for EMT-I class
 - \$1200 for Primary Instructor class
 - \$24,000 for defibrillators
 - \$1719.16 for intubation kits
 - \$584.32 for glucose testing equipment
 - \$1180.00 for ALS Bags
 - \$391.60 for chest decompression equipment
 - \$500 for IV supplies
 - \$600 for Train the Trainer
 - \$7507.00 for an ALS adult training mannequin
 - \$5502.00 for an ALS child training mannequin
 - \$1655.50 for adult and infant airway simulators
 - \$312.00 for an IV arm
 - \$2598.00 for textbooks
 - \$15,468.75 Overtime for Career Personnel during class
- TOTAL ESTIMATED PROGRAM COST**
\$112,757.23

It should be noted that the above costs are a fixed one time expense. As happens currently, all used equipment would be billed for and replaced by the ambulance service. Additionally, there is no change in operational costs as a result of increased insurance premiums according to Provident insurance. The only cost that cannot be accounted for is the increased cost of personnel salaries as a result of the new training and responsibilities. This figure would have to be determined by personnel representatives and the department administration.

With regards to program benefit, it is difficult to discuss this when taking into account intangible things such as the value of a human life. On the other hand, there are tangible benefits to the proposed program, specifically, the provision of our own training for department personnel. Currently the department pays nearly \$1200.00 for each person attending EMT class, and another \$4000.00 annually for specialized rescue. This accounts for roughly \$14000 annually, all of which could be offset by having departmental Primary Instructors. As for the initial cost for program implementation, funds are available from outside sources (State of Indiana, and FEMA) for all associated costs including personnel overtime.

Conclusion

The Bloomington Township Fire Department is located geographically to provide the most rapid service possible to all constituents. This rapid response combined with a proportionately large EMS, rescue, hazardous materials call volume, and extended scene times prior to ALS ambulance arrival necessitate a change. The department must shift to focus on these routine emergencies. Making these changes is consistent with the fire service mission of saving life, and also with other departments' operations in the state. More importantly, these changes are consistent with the history of the fire department, and the goal of providing the best service possible.

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